United States
Department of
Agriculture

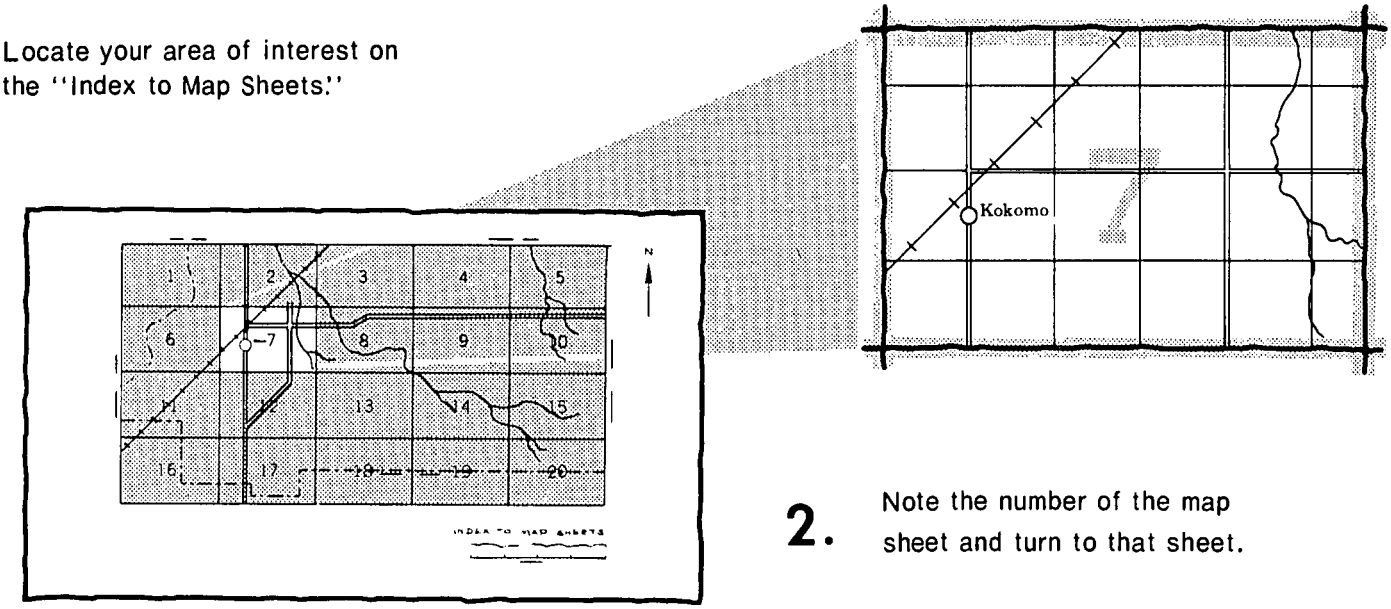
Soil
Conservation
Service

In cooperation with
Cornell University Agricultural
Experiment Station

Soil Survey of Nassau County New York

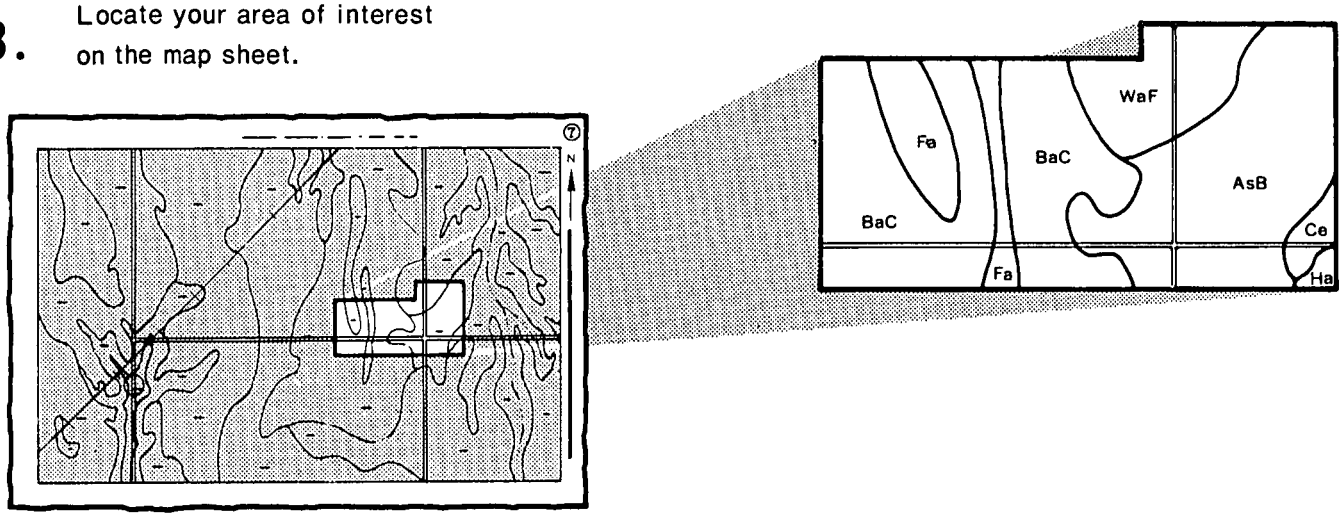
HOW TO USE

1. Locate your area of interest on the "Index to Map Sheets."

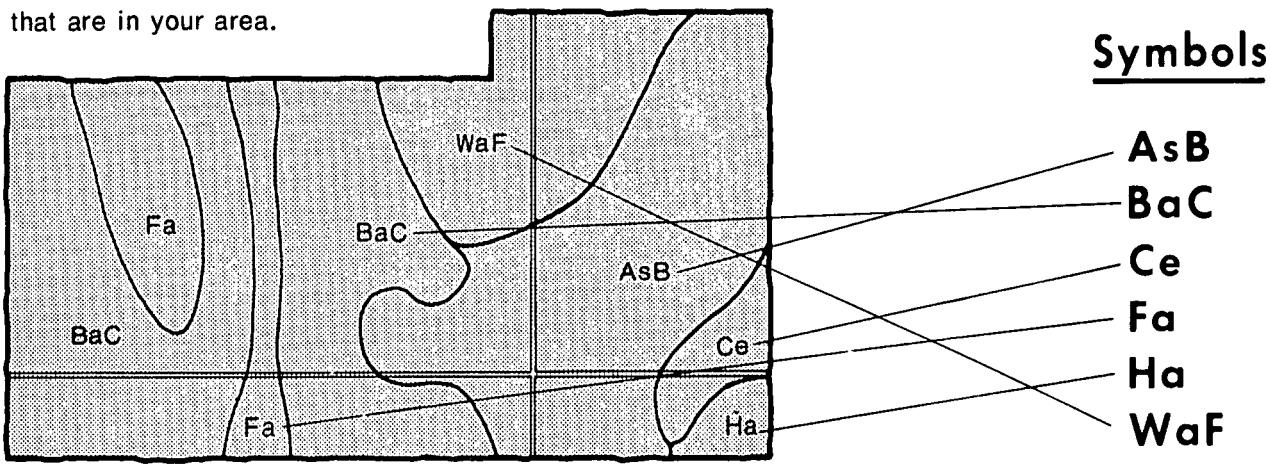


2. Note the number of the map sheet and turn to that sheet.

3. Locate your area of interest on the map sheet.

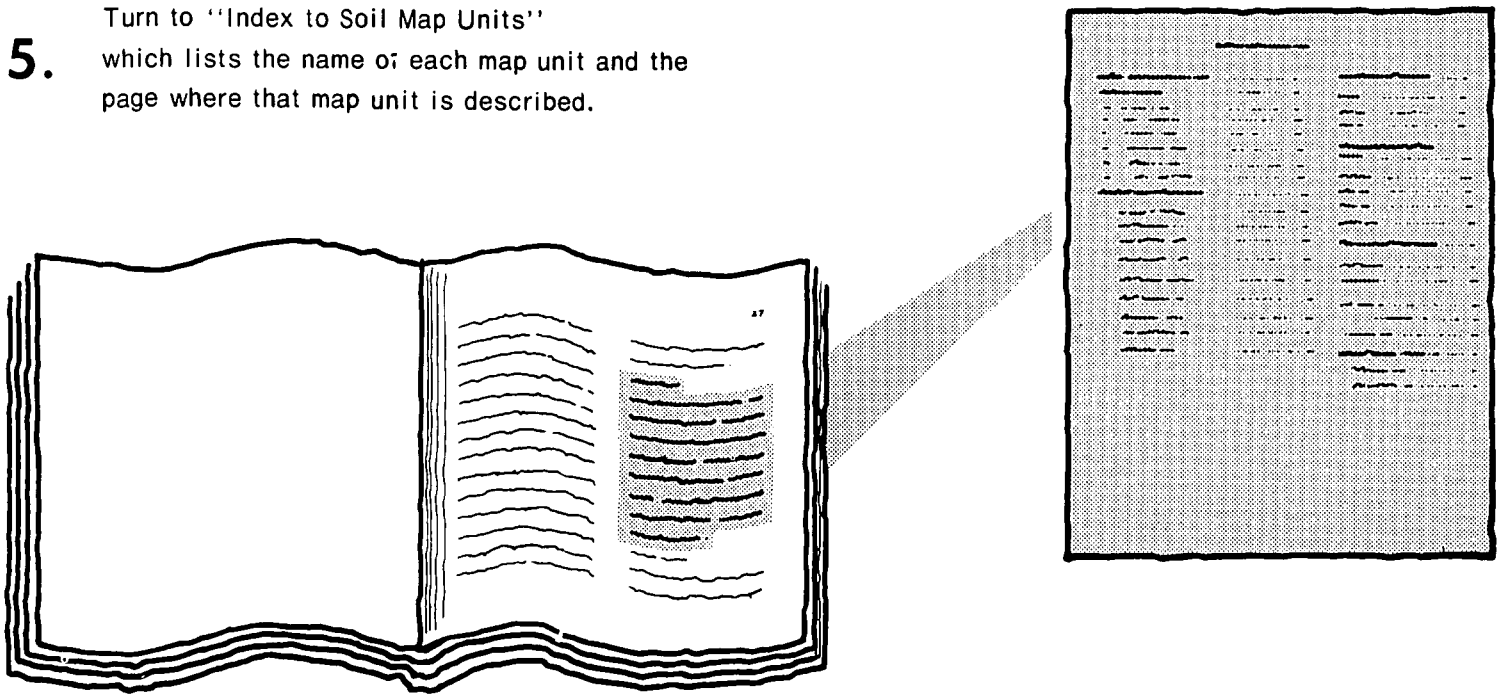


4. List the map unit symbols that are in your area.

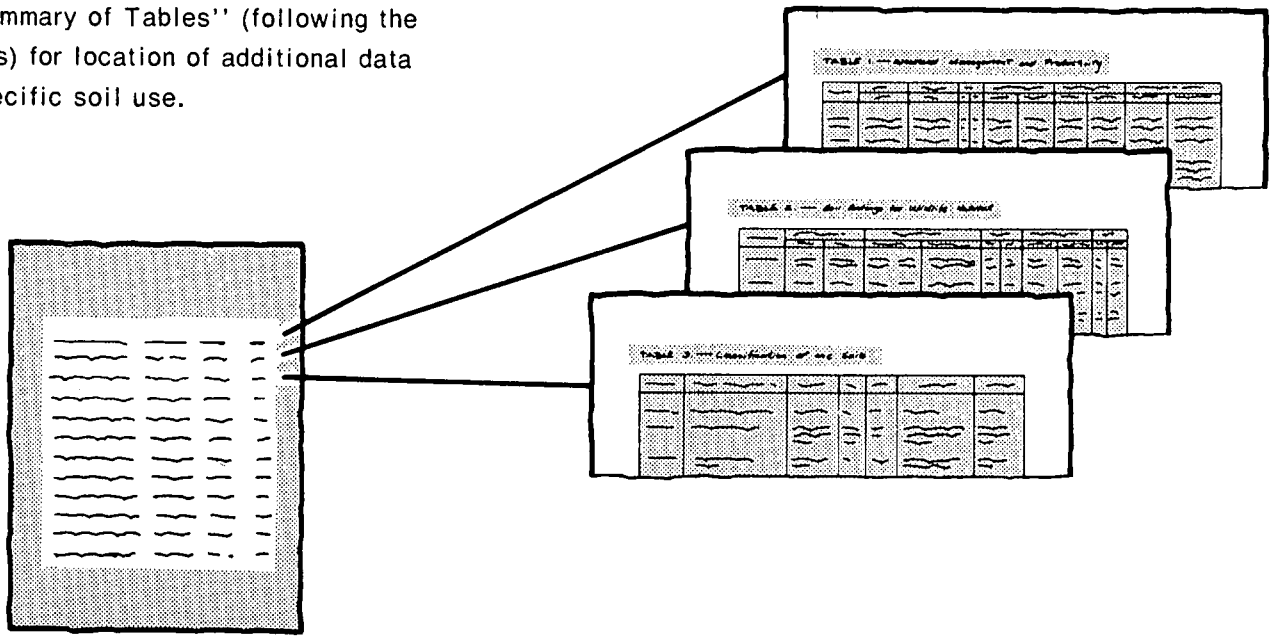


THIS SOIL SURVEY

5. Turn to "Index to Soil Map Units" which lists the name of each map unit and the page where that map unit is described.



6. See "Summary of Tables" (following the Contents) for location of additional data on a specific soil use.



7. Consult "Contents" for parts of the publication that will meet your specific needs. This survey contains useful information for farmers or ranchers, foresters or agronomists; for planners, community decision makers, engineers, developers, builders, or homebuyers; for conservationists, recreationists, teachers, or students; to specialists in wildlife management, waste disposal, or pollution control.

This soil survey is a publication of the National Cooperative Soil Survey, a joint effort of the United States Department of Agriculture and other federal agencies, state agencies including the Agricultural Experiment Stations, and local agencies. The Soil Conservation Service has leadership for the federal part of the National Cooperative Soil Survey. In line with Department of Agriculture policies, benefits of this program are available to all, regardless of race, color, national origin, sex, religion, marital status, or age.

Major fieldwork for this soil survey was completed in 1982. Soil names and descriptions were approved in 1983. Unless otherwise indicated, statements in this publication refer to conditions in the survey area in 1983. This survey was made cooperatively by the Soil Conservation Service and the Cornell University Agricultural Experiment Station. The survey is part of the technical assistance furnished to the Nassau County Soil and Water Conservation District. Partial funding for this survey was provided by the Nassau County through the Nassau County Soil and Water Conservation District.

Soil maps in this survey may be copied without permission. Enlargement of these maps, however, could cause misunderstanding of the detail of mapping. If enlarged, maps do not show the small areas of contrasting soils that could have been shown at a larger scale.

Cover: Part of the Urban land-Montauk-Riverhead general soil map unit.

Contents

Soil Series

Issued February 1987

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Summary of Tables

Foreword

This soil survey contains information that can be used in land-planning programs in Nassau County. It contains predictions of soil behavior for selected land uses. The survey also highlights limitations and hazards inherent in the soil, improvements needed to overcome the limitations, and the impact of selected land uses on the environment.

This soil survey is designed for many different users. Gardeners, agronomists, and horticulturists can use it to evaluate the potential of the soil for vegetables and for various kinds of trees and shrubs. Planners, community officials, engineers, developers, builders, and home buyers can use the survey to plan land use, select sites for construction, and identify special practices needed to ensure proper performance. Conservationists, teachers, students, and specialists in recreation, wildlife management, waste disposal, and pollution control can use the survey to help them understand, protect, and enhance the environment.

Great differences in soil properties can occur within short distances. Some soils are seasonally wet or subject to flooding. Some are too unstable to be used as a foundation for buildings or roads. Clayey or wet soils are poorly suited to use as septic effluent absorption fields. A high water table makes a soil poorly suited to basements or underground installations.

These and many other soil properties that affect land use are described in this soil survey. Broad areas of soils are shown on the general soil map. The location of each soil is shown on the detailed soil maps. Each soil in the survey area is described. Information on specific uses is given for each soil. Help in using this publication and additional information are available at the local office of the Soil Conservation Service or the Cooperative Extension Service.

Paul A. Dodd
State Conservationist
Soil Conservation Service

Soil Survey of Nassau County, New York

By John P. Wulforst, Soil Conservation Service

Fieldwork by Albert N. Averill, Jr., Kevin A. Connelly, Laurence D. Day, Marjorie Faber, Bradford A. Higgins, Stephen J. Page, Paul A. Ray, Luther H. Robinson, Theodore D. Trevail, Kenneth W. Van Doren, Keith A. Wheeler, and John P. Wulforst, Soil Conservation Service

United States Department of Agriculture,
Soil Conservation Service,
in cooperation with
Cornell University Agricultural Experiment Station

NASSAU COUNTY is on Long Island, the southeasternmost part of New York State (fig. 1). The county has a land area of 192,000 acres. Mineola, the county seat, is just west of the geographic center of the county. The 1980 census lists the population of the county at about 1.3 million (*10*).

This soil survey of Nassau County provides more information than surveys of the county that were published in 1904 and 1928, and it has maps that show the soils in greater detail.

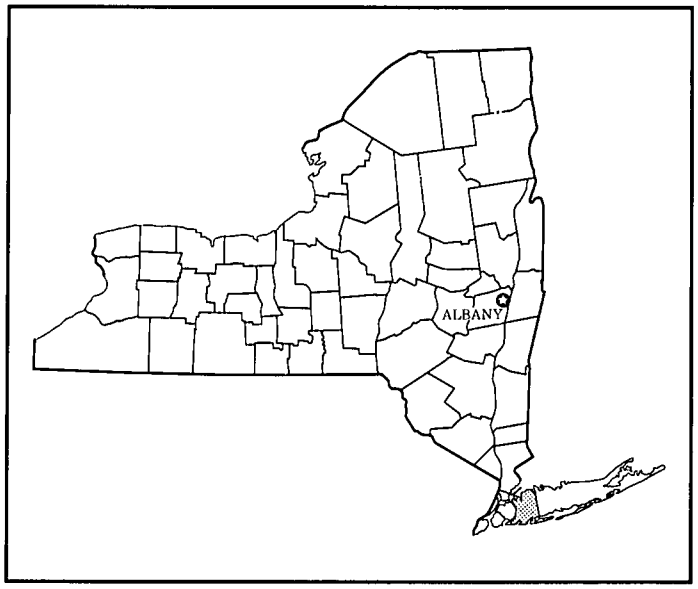

Figure 1.—Location of Nassau County in New York.

General Nature of the County

This section provides general information about some of the natural and cultural factors that affect land use in Nassau County.

Climate

Prepared by the National Climatic Center, Asheville, North Carolina.

Precipitation in Nassau County is well distributed throughout the year. The precipitation in winter frequently occurs as snow, but the ground usually does not stay covered for more than a few days at a time.

Table 1 gives data on temperature and precipitation for the survey area as recorded at Mineola in the period 1951 to 1980. Table 2 shows probable dates of the first freeze in fall and the last freeze in spring. Table 3 provides data on length of the growing season.

In winter the average temperature is 33 degrees F, and the average daily minimum temperature is 27 degrees. The lowest temperature on record, which occurred at Mineola on January 27, 1976, is -1 degree. In summer the average temperature is 72 degrees, and the average daily maximum temperature is 81 degrees. The highest recorded temperature, which occurred at Mineola on July 3, 1966, is 103 degrees.

Growing degree days are shown in table 1. They are equivalent to "heat units." During the month, growing degree days accumulate by the amount that the average temperature each day exceeds a base temperature (40 degrees F). The normal monthly accumulation is used to schedule single or successive plantings of a crop between the last freeze in spring and the first freeze in fall.

The total annual precipitation is 42 inches. Of this, 21 inches, or 50 percent, usually falls in April through September. The growing season for most crops falls within this period. In 2 years out of 10, the rainfall in April through September is less than 16 inches. The heaviest 1-day rainfall during the period of record was 8.2 inches at Mineola on August 12, 1955 . Thunderstorms occur on about 22 days each year, and most occur in summer.

The average seasonal snowfall is 27 inches. The greatest snow depth at any one time during the period of record was 29 inches. On the average, 15 days of the year have at least 1 inch of snow on the ground. The number of such days varies greatly from year to year.

The average relative humidity in midafternoon is about 55 percent. Humidity is higher at night, and the average at dawn is about 70 percent. The sun shines 65 percent of the time possible in summer and 50 percent in winter. The prevailing wind is from the west-northwest. Average windspeed is highest, 14 miles per hour, in spring.

Physiography and Geology

Bernard S. Ellis, geologist, Soil Conservation Service, assisted with this section.

Nassau County is part of the Coastal Plain physiographic province. The county is characterized by undulating or rolling landscapes in the northern part and a flat plain with a gently southward tilt in the southern part. A lobe of rolling topography protrudes farther to the south along the eastern edge of the county. Extensive tidal areas and marshes are just south of the plain, and a barrier beach and dunes form the southern outline of the county.

Elevation in the county ranges from sea level to about 340 feet above sea level near the eastern edge of the county, just south of NY Route 25. The landforms at the higher elevations were deposited as a terminal moraine. These areas have irregular topography that is crossed by deep glacial drainage channels near the north shore. These channels empty into deep bays on the north shore. The steepest relief is along drainage channels or on the side slopes adjacent to the bays. An outwash plain, which is to the south of the terminal moraine, has a maximum elevation of about 180 feet just northeast of Hicksville and slopes gradually to the south some 8 to 10 miles, finally reaching tidal areas at sea level.

Nassau County is underlain by bedrock, but most of it is at a depth of several hundred feet. The closest surficial bedrock is to the west in the boroughs of Bronx and Queens in New York City and areas to the northwest in Westchester County, near Long Island Sound. From these areas of surface exposure, the rock surface dips to the southeast to form a solid basement below Nassau County. Most of the bedrock consists of Cretaceous sedimentary layers (*3*). Some of the older rocks in the area are the 200-million-year-old Triassic red beds and lava flows off New Jersey and Connecticut and the Cambrian metamorphic rocks in the New York City area that are 450 million years old.

During the Late Cretaceous Period the sediments from the eroding Appalachian Highlands were carried by streams and rivers to low-lying coastal areas. The sand, silt, and clay of the Raritan and Magothy formations, which form the foundation of Long Island, were deposited as deltas in areas of shallow water. The Raritan formation is below sea level, and the Magothy formation is at the surface of several sites along the north shore.

During the Tertiary Period the area of Long Island was uplifted above sea level and the Cretaceous sediments were eroded and dissected by streams and rivers. The valley now occupied by Long Island Sound was cut by a major river, and smaller tributary streams formed valleys which are now the north shore bays.

During the Pleistocene Epoch of the Quaternary Period, several major glacial advances into the northern United States occurred. This epoch is divided into four major glacial stages. From oldest to youngest, they are: Nebraskan, Kansan, Illinoian, and Wisconsin. During the Illinoian advance, the ice sheet reached a position just north of the Long Island area. Outwash sand and gravel, of the Jameco gravel formation, was deposited by meltwater streams. Following the Illinoian stage, sea level rose close to its present level and a clay (Gardiners clay) containing marine fossils was deposited in the shallow coastal waters surrounding Long Island.

During the Wisconsin glacial advance, the ice reached a position represented on most of Long Island by the Ronkonkoma terminal moraine. In the latter part of this stage, the ice sheet receded from a point east of Lake Success and established a new position along the north shore marked by the Harbor Hill terminal moraine. West of Lake Success this lobe of ice overrode the Ronkonkoma moraine and pushed as far south as Staten Island. This caused the terminal moraine deposits in Nassau County to form a wide band of irregular topography occupying the northern half of the county, while in adjacent Suffolk County the terminal moraine

deposits were far enough apart to be two distinct landforms separated by a flat plain. During the Wisconsin advance, sea level dropped about 350 feet below its current elevation to expose a broad, flat coastal plain.

As the climate again warmed about 11,000 years ago, the Wisconsin period ended and the Holocene, or present, period began. The ice sheet receded to its present polar limits, and sea level rose to its present level. Currents and wave action modified the outwash plain to create the present-day shoreline.

Drainage

A few perennial streams drain the county. The longer streams carry runoff water to the estuaries of the south shore. From west to east, they are Valley Stream, Mill River, East Meadow Brook, Bellmore Creek, and Massapequa Creek. A few shorter creeks, such as Hook, Motts, Powell, and Seaford Creeks, also drain toward the south shore.

Most of the drainage to the north shore is intermittent. Glen Cove Creek and Mill Neck Creek are the longest creeks that drain toward the north shore; other shorter, mostly intermittent creeks drain into the bays of the north shore. A sizable portion of the runoff that originates between NY Routes 25 and 25A enters the ground water by collecting in natural closed depressions or landlocked ponds.

Much of the runoff on paved surfaces in recently developed areas is recharged into the ground water system by routing it into dug pits or recharge basins.

Water Supply

The primary water supply in the county is underground aquifers. This source is in a saturated wedge-shaped mass of unconsolidated deposits that overlie nearly impermeable consolidated bedrock. There are two major types of aquifers: a confined aquifer with ground water under artesian pressure and an unconfined aquifer in a water table (*4*).

The contour of the surface of the water table of Nassau County is roughly the same as that of the landscape topography. The water table is closest to the surface at the terminal moraine and is deeper toward the coasts. The artesian pressure surfaces generally are a few feet lower than the water table near the middle of the island, and they are a few feet higher than the water table near the coasts.

The aquifer system is in recognizable separate units. The upper glacial, or water table, aquifer is at the least depth and is made up primarily of sand and gravel deposits from the most recent glacial period. Deeper in the unconsolidated deposits are layers of good water-bearing strata. These are the Jameco, Magothy, and Lloyd aquifers. The Lloyd is the deepest and rests on bedrock.

Initially most wells were drilled into the shallower strata. As the population increased and supplying water became a municipal effort, wells were drilled into deeper strata and the shallower aquifers became more polluted as the amount of cesspool discharge reaching those aquifers increased.

Since much of the county borders saltwater, the encroachment of salt into the freshwater layers is a hazard. This intrusion results because the fresh ground water, salty ground water, and salty sea water are interconnected. Generally, if the freshwater reservoir is pumped out at rates that exceed natural recharge from surface precipitation, saltwater will occupy the void.

Effects of Man and Urbanization

The landscape of Nassau County has changed drastically over the past 50 years. Extensive housing developments, shopping centers, industrial complexes, and business corridors now dominate areas where vast acreages of potatoes and other crops were once grown for markets in New York City. The large areas of well drained, nearly level soils have provided suitable sites for development. Rapid urbanization has created an ever-increasing demand for public services, waste-disposal facilities, and recreation areas.

The main relatively undisturbed open areas are in the southern part of the county. Most are in golf courses, municipal parks, greenbelts bordering parkways, scattered wildlife preserves along drainageways, tidal marshes, and barrier beaches. The soils immediately along the slope that are sites for houses, marinas, and park facilities, such as at Wantaugh Cow Meadow, Oceanside, Baldwin Harbor, and Bay Park, largely consist of dredgings from the bays and the ocean. These areas are mostly sandy soils that are variable in drainage due to the shallow depth of the water table. Many of these areas, including residences and small parks, experience inundation during abnormal high spring tides and winter storms. Soils in small parks, picnic areas, and athletic fields have often become compacted through intensive use, making planting and maintenance of grasses and shrubs difficult. Many areas within the larger parks, including Eisenhower Park, Bethpage State Park, and Restoration Village, the upper reaches of Valley Stream Park, and Hempstead Lake State Park, have retained much of their native quality, partly because of soil management to control erosion.

Some areas in the northern part of the county are still open and undisturbed. These areas are in a few vegetable and horse farms, areas of abandoned farms, large estates, partially wooded areas, preserve properties, and low-density or cluster subdivisions. The undulating to steep rolling glacial tills common to the north-central part of the county are variable in drainage, depending upon whether they are at the top of ridges or in low-lying pockets, and many of these soils have a

compacted substratum causing a perched seasonal high water table. This variable drainage, coupled with variable slopes, makes development in this area more difficult and demonstrates the need for construction activities that use proper erosion control practices. Sandy soils on the ridges are commonly droughty and have a thin layer of topsoil and often require loamy fill for successful landscape plantings. Soils with no plant cover and large gullies are common in playgrounds, vacant lots, and some parks, while undisturbed woods and old fields on estate properties in the same areas rarely show signs of erosion, except along some equestrian trails.

Piecemeal grading and shaping operations and abandoned sand and gravel pits have left many unstable and hazard-prone banks in the county. Manmade areas, such as ground water recharge basins, which are deep pits excavated into the substratum of the soil, are scattered throughout the county and are further evidence of man's activity. Some other manmade areas are sanitary landfills and dredge spoil sites.

How This Survey Was Made

This survey was made to provide information about the soils in the survey area. The information includes a description of the soils and their location and a discussion of the suitability, limitations, and management of the soils for specified uses. Soil scientists observed the steepness, length, and shape of slopes; the general pattern of drainage; and the kinds of crops and native plants growing on the soils. They dug many holes to study the soil profile, which is the sequence of natural layers, or horizons, in a soil. The profile extends from the surface down into the unconsolidated material in which the soil formed. The unconsolidated material has few or no roots or other living organisms and has been changed very little by other biologic activity.

The soils in the survey area occur in an orderly pattern that is related to the geology, the landforms, relief, climate, and the natural vegetation of the area. Each kind of soil is associated with a particular kind of landscape or with a segment of the landscape. By observing the soils in the survey area and relating their position to specific segments of the landscape, a soil scientist develops a concept, or model, of how the soils were formed. Thus, during mapping, this model enables the soil scientist to predict with considerable accuracy the kind of soil at a specific location on the landscape.

Commonly, individual soils on the landscape merge into one another as their characteristics gradually change. To construct an accurate soil map, however, soil scientists must determine the boundaries between the soils. They can observe only a limited number of soil profiles. Nevertheless, these observations, supplemented by an understanding of the soil-landscape relationship, are sufficient to verify predictions of the kinds of soil in an area and to determine the boundaries.

Soil scientists recorded the characteristics of the soil profiles that they studied. They noted soil color, texture, size and shape of soil aggregates, kind and amount of rock fragments, distribution of plant roots, acidity, and other features that enable them to identify soils. After describing the soils in the survey area and determining their properties, the soil scientists assigned the soils to taxonomic classes. Taxonomic classes are concepts. Each taxonomic class has a set of soil characteristics with precisely defined limits. The classes are used as a basis for comparison to classify soils systematically. The system of taxonomic classification used in the United States is based mainly on the kind and character of soil properties and the arrangement of horizons within the profile. After the soil scientists classified and named the soils in the survey area, they compared the individual soils with similar soils in the same taxonomic class in other areas so that they could confirm data and assemble additional data based on experience and research.

While a soil survey is in progress, samples of some of the soils in the area generally are collected for laboratory analyses and for engineering tests. Soil scientists interpreted the data from these analyses and tests as well as the field-observed characteristics and the soil properties in terms of expected behavior of the soils under different uses. Interpretations for all of the soils were field tested through observation of the soils in different uses under different levels of management. Some interpretations are modified to fit local conditions, and new interpretations sometimes are developed to meet local needs. Data were assembled from other sources, such as research information, production records, and field experience of specialists.

Predictions about soil behavior are based not only on soil properties but also on such variables as climate and biological activity. Soil conditions are predictable over long periods of time, but they are not predictable from year to year. For example, soil scientists can state with a fairly high degree of probability that a given soil will have a high water table within certain depths in most years, but they cannot assure that a high water table will always be at a specific level in the soil on a specific date.

After soil scientists located and identified the significant natural bodies of soil in the survey area, they drew the boundaries of these bodies on aerial photographs and identified each as a specific map unit. Aerial photographs show trees, buildings, fields, roads, and rivers, all of which help in locating boundaries accurately.

Map Unit Composition

A map unit delineation on a soil map represents an area dominated by one major kind of soil or an area dominated by several kinds of soil. A map unit is

identified and named according to the taxonomic classification of the dominant soil or soils. Within a taxonomic class there are precisely defined limits for the properties of the soils. On the landscape, however, the soils are natural objects. In common with other natural objects, they have a characteristic variability in their properties. Thus, the range of some observed properties may extend beyond the limits defined for a taxonomic class. Areas of soils of a single taxonomic class rarely, if ever, can be mapped without including areas of soils of other taxonomic classes. Consequently, every map unit is made up of the soil or soils for which it is named and some soils that belong to other taxonomic classes. These latter soils are called inclusions or included soils.

Most inclusions have properties and behavioral patterns similar to those of the dominant soil or soils in the map unit, and thus they do not affect use and management. These are called noncontrasting (similar) inclusions. They may or may not be mentioned in the map unit descriptions. Other inclusions, however, have properties and behavior divergent enough to affect use or require different management. These are contrasting (dissimilar) inclusions. They generally occupy small areas and cannot be shown separately on the soil maps because of the scale used in mapping. The inclusions of contrasting soils are mentioned in the map unit descriptions. A few inclusions may not have been observed and consequently are not mentioned in the descriptions, especially where the soil pattern was so complex that it was impractical to make enough observations to identify all of the kinds of soil on the landscape.

The presence of inclusions in a map unit in no way diminishes the usefulness or accuracy of the soil data. The objective of soil mapping is not to delineate pure taxonomic classes of soils but rather to separate the landscape into segments that have similar use and management requirements. The delineation of such landscape segments on the map provides sufficient information for the development of resource plans, but onsite investigation is needed to plan for intensive uses in small areas.

General Soil Map Units

The general soil map at the back of this publication shows the soil associations in this survey area. Each association has a distinctive pattern of soils, relief, and drainage. Each is a unique natural landscape. Typically, an association consists of one or more major soils or Urban land and some minor soils. It is named for the major soils. The soils making up one association can occur in another but in a different pattern.

The general soil map can be used to compare the suitability of large areas for general land uses. Areas of suitable soils can be identified on the map. Likewise, areas where the soils are not suitable can be identified.

Because of its small scale, the map is not suitable for planning the management of a farm or field or for selecting a site for a road or building or other structure. The soils in any one association differ from place to place in slope, depth, drainage, and other characteristics that affect management.

The general soil map units in Nassau County are described on the following pages. The textural terms in the introductory statement for each unit apply to the surface layer of the major soils. The terms denoting drainage also apply only to the major soils. Some units contain soils that are less sloping or more sloping than the range given in the introductory statement. The text indicates the range of slope within the unit.

In some areas along the borders of Nassau County, the boundaries on the general soil map and the names of the general soil map units do not match those of adjoining counties. These discrepancies exist because of differences in the detail of mapping, changes in soil classification, and different proportions of the same soil in adjoining counties.

General Soil Map Unit Descriptions

1. Ipswich-Udipsamments

Dominantly nearly level, very poorly drained, organic soils and nearly level, moderately well drained to excessively drained, coarse-textured soils; on tidal flats

This general soil map unit consists of low organic deposits and low sandy mounds over organic deposits (fig. 2). Drainage channels dissect the small areas of the organic soils. All but the highest parts of the sandy mounds are subject to tidal inundation. Slope is dominantly 0 to 3 percent but is as much as 5 percent.

This unit makes up about 6.9 percent of the county. The unit is about 65 percent Ipswich soils, 20 percent Udipsamments, and 15 percent soils of minor extent.

The Ipswich soils are very poorly drained and are in flat areas inundated by saltwater at high tide. The surface layer of the soils is a mat of dark grayish brown roots. The subsurface layers are black, partially decomposed muck and peat. The bottom layer is very dark grayish brown, well decomposed muck.

The Udipsamments are moderately well drained to excessively drained fill, most of which has been placed over tidal organic sediments. The Udipsamments have a thin surface layer of grayish brown loamy sand. The substratum is light gray sand.

The minor soils are very poorly drained Pawcatuck and Matunuck soils. The Pawcatuck soils are organic sediments that have a substratum of sand. The Matunuck soils are sandy and have a thin mucky surface layer. Some areas consist of sandy soil that is shifted by the wind.

Most of the acreage of the Ipswich soils supports a cover of saltwater-tolerant grasses and reeds. Most areas of the Udipsamments support a combination of brush and drought-tolerant grasses and weeds. The top of the Ipswich soils is at a level equal to normal high tide. In most areas 6 to 8 vertical feet of the material is exposed at low tide. During windy days, the windward areas are subject to erosion by waves. Many of the dissecting channels are navigable by small craft at high tide but drain completely at low tide.

In its natural state, this unit is too wet for residential development, and coastal storms and high storm tides inundate most areas of this unit.

The unit is well suited as a habitat for wetland wildlife, such as ducks and geese. The nearly open bodies of water and exposed tidal flats are inhabited by various species of marine life.

2. Montauk-Enfield

Dominantly nearly level to strongly sloping, well drained, medium-textured and moderately coarse textured soils; on knolls and hills

This general soil map unit consists of very deep soils on upland areas. The steeper parts are on hillsides or along the sides of drainageways. The less sloping areas are on broad ridgetops and hillcrests or on foot slopes.

Figure 2.—Typical landscape of Ipswich-Udipsamments general soil map unit. Udipsamments are in the foreground, and Ipswich soils are in the tidal area surrounded by water in the background.

A few intermittent streams drain parts of this unit. In a few areas stones and boulders are on the surface. Slope dominantly ranges from 0 to 15 percent.

This unit makes up about 14.7 percent of the survey area. The unit is about 65 percent Montauk soils, 10 percent Enfield soils, and 25 percent soils of minor extent (fig. 3).

The Montauk soils are on landscapes that range from nearly level hillcrests to strongly sloping side slopes. The soils have a surface layer of dark grayish brown silt loam or fine sandy loam. The subsoil is yellowish brown gravelly loam or sandy loam. The substratum is firm, light yellowish brown gravelly loamy sand.

The Enfield soils are on nearly level to gently sloping areas. They have a surface layer of dark brown silt loam. The subsoil is yellowish brown silt loam. The substratum is light yellowish brown very gravelly sand.

Of minor extent are moderately well drained Scio soils in low flat areas and somewhat poorly drained Wallington soils and poorly drained to somewhat poorly drained Walpole soils in depressions. Small enclaves of Urban land are throughout this unit.

A major part of this unit is in native vegetation or a forest cover of mostly hardwoods, mainly red maple, beech, and oak. Also in the unit are a few vegetable farms and horse farms, a few golf courses, and some low-density housing.

The major concern for residential development of the unit is sewage effluent disposal. The Montauk soils have a dense, slowly permeable substratum that hinders efficient sewage disposal. The Enfield soils have a very rapidly permeable substratum that is a poor filter of effluent, and thus there is the threat of pollution to the ground water. In some of the hilly areas and stream-dissected areas, slope limits the placement of dwellings or local streets and roads. The frost-action potential is moderate in the major soils.

Slope and small stones in the soil are the main limitations for playgrounds. The small stones and strong acidity limit landscaping.

3. Riverhead-Enfield-Urban land

Dominantly nearly level to strongly sloping, well drained, moderately coarse textured and medium-textured soils and Urban land; on low hills and ridges

This general soil map unit consists of very deep soils. The nearly level areas are on broad ridgecrests and hilltops, and the steeper parts are along hillsides or the sides of drainageways. A few intermittent streams drain some areas. The Urban land part of the unit is dominantly in small villages. Slope in this unit ranges from 0 to 25 percent but mostly ranges from 0 to 15 percent.

This unit makes up about 10 percent of the survey area. The unit is about 50 percent Riverhead soils, 18 percent Enfield soils, 10 percent Urban land, and 22 percent soils of minor extent (fig. 4).

The Riverhead soils are nearly level to moderately steep. They have a surface layer of brown sandy loam. The subsoil is strong brown or yellowish brown sandy loam. The substratum is brownish yellow sand and gravelly sand.

The Enfield soils are nearly level or gently sloping. They have a surface layer of dark brown silt loam. The subsoil is yellowish brown silt loam. The substratum is light yellowish brown very gravelly sand.

Urban land consists of buildings, roads, driveways, parking lots, or other manmade structures. Most areas are nearly level or gently sloping, but a few are strongly sloping.

Of minor extent are well drained Montauk soils that have a dense substratum, moderately well drained Scio and Sudbury soils in low areas, and poorly drained and somewhat poorly drained Walpole soils in depressions and along drainageways. Gravel pits, beaches, and tidal-area soils are in a few places.

Most of this unit is in woodland, mostly oaks. Most of the cleared areas are used for residential development or are in a grassy cover.

The major limitation of this unit for residential development, including homesites and streets, is slope in

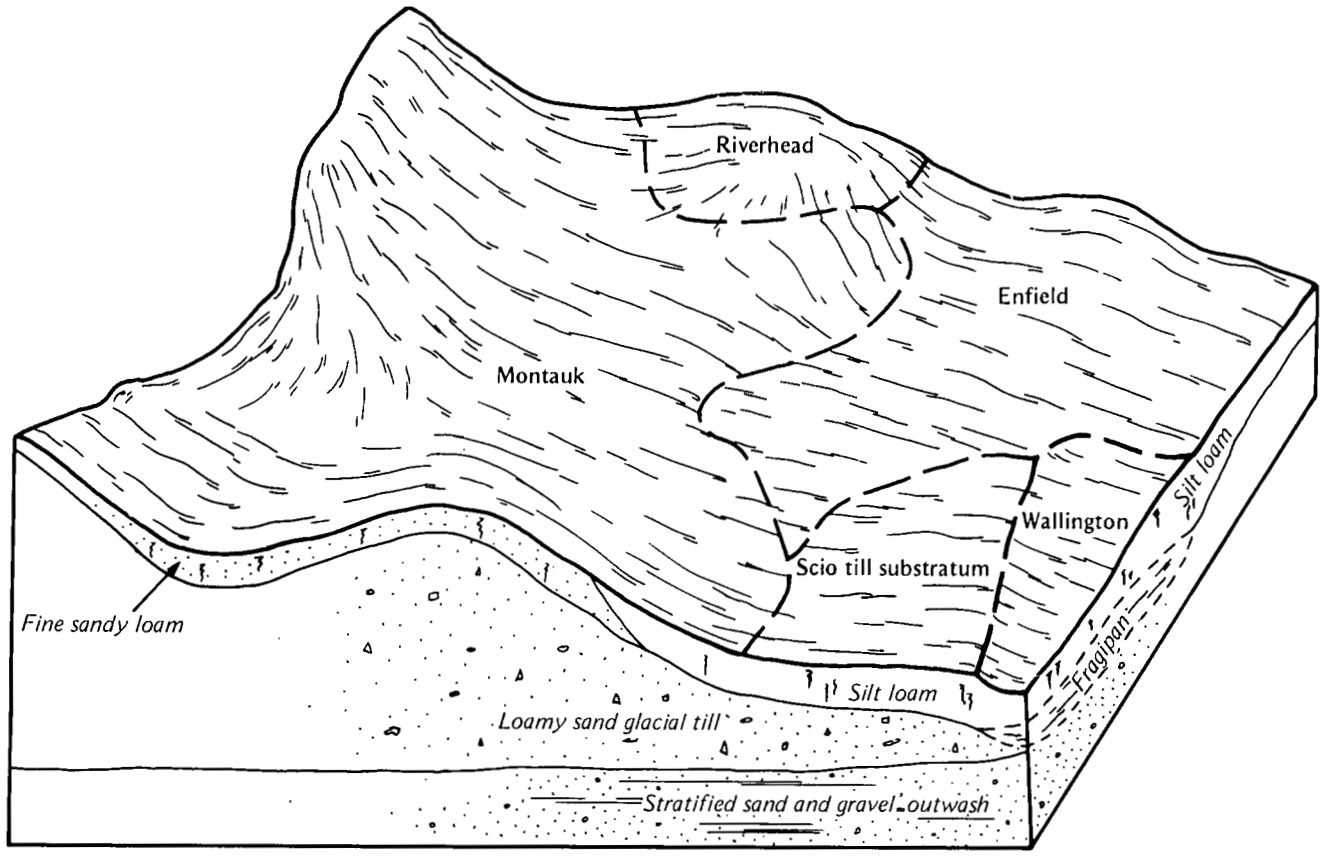

Figure 3.—Typical relationship of soils and underlying deposits in the Montauk-Enfield general soil map unit.

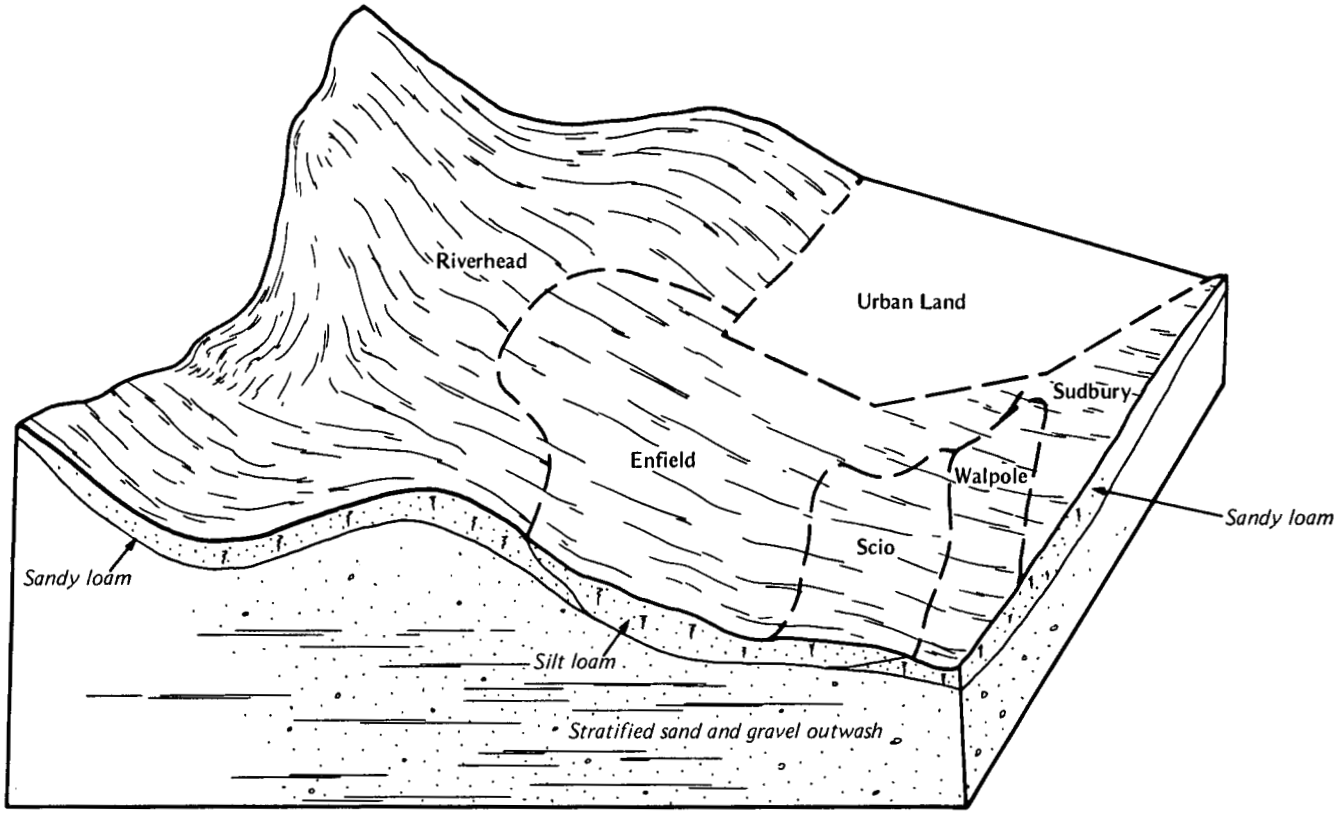

Figure 4.—Typical relationship of soils and underlying deposits in the Riverhead-Enfield-Urban land general soil map unit.

some areas. The dominant soils have adequate permeability for onsite sewage effluent disposal, but because permeability is very rapid in the substratum there is a hazard that effluent will not be filtered properly and will pollute ground water.

Slope and small stones in some of the soils in this unit are limitations for playgrounds. Mixing the substratum with the surface layer of the major soils can result in increased sandiness and cause the soil to be more droughty.

The small stones and strong acidity common to the dominant soils are minor limitations for landscaping. Grading generally makes the surface layer more sandy and, consequently, more droughty.

4. Riverhead-Plymouth

Dominantly moderately steep or steep, well drained and excessively drained, moderately coarse textured and coarse-textured soils; on hillsides

This general soil map unit consists of very deep soils. The soils are mainly near drainageways and hillsides that generally are adjacent to bays on Long Island Sound. Where this unit is adjacent to open water, wave action has caused bluffs to form along the shoreline. Short, mostly intermittent streams drain the areas. Slope ranges from 15 to 35 percent.

This unit makes up about 4.2 percent of the survey area. The unit is about 55 percent Riverhead soils, 30 percent Plymouth soils, and 15 percent minor soils (fig. 5).

The Riverhead soils are well drained and dominantly moderately steep. They have a surface layer of brown sandy loam. The subsoil is strong brown or yellowish brown sandy loam. The substratum is brownish yellow sand and gravelly sand.

The Plymouth soils are excessively drained and are on convex hillcrests and steep side slopes. They have a surface layer of brown loamy sand. The subsoil is strong brown or yellowish brown loamy sand. The substratum is brownish yellow or pale yellow sand.

Of minor extent are well drained Montauk soils that have a dense substratum and very poorly drained Berryland and Manahawkin soils along drainageways. Small villages and strips of other Urban land are in this unit. In some areas narrow beaches are adjacent to Long Island Sound.

A high percentage of this unit is in woodland. The stands are mixed hardwoods, and some areas have a

good understory of laurel. Most of the cleared areas are near scattered residential developments.

The major limitation for residential development is the moderately steep or steep slopes. Removal of the tree canopy and ground cover creates a severe erosion hazard during construction.

Slope and stones on the surface of some areas are the main limitations of this unit for most types of intensive recreation use, such as playgrounds. Removal of plant cover for construction of facilities for intensive recreation causes an erosion hazard.

5. Udipsamments-Beaches-Urban land

Dominantly nearly level or gently sloping, excessively drained to moderately well drained, coarse-textured soils, Beaches, and Urban land; on barrier beaches

Most areas of this general soil map unit are on or near beaches formed by tidal and wave action. Some areas consist of stabilized sandy fill material. Parts of some areas are affected by wind erosion. Slope is dominantly 0 to 8 percent.

This unit makes up about 3.5 percent of the county. The unit is about 40 percent Udipsamments, 25 percent Beaches, 15 percent Urban land, and 20 percent minor soils (fig. 6).

Udipsamments are deep and are on open landscapes. These soils are excessively drained to moderately well drained where the sand overlies buried organic tidal sediments, but most areas are excessively drained. In most areas these soils have a thin, dark grayish brown surface layer of loamy sand. The substratum is light brownish gray sand.

Beaches are sandy areas that are subject to constant wave action mostly by the Atlantic Ocean. They slope gently seaward and are between the levels of normal high and low tide.

The Urban land consists of buildings, roads, parking lots, driveways, and other manmade features.

Of minor extent are very poorly drained Matunuck and Pawcatuck soils in tidal depressions or on low flats. Duneland is in areas where sand has blown and accumulated from the beaches.

About half of the unit is covered by barrier-beach vegetation, mostly scrubby oak or pine trees, brush, and salt-tolerant grasses and reeds. The other half consists of open areas of beaches and dunes and manmade structures. The eastern part of the barrier beach has a higher proportion of Udipsamments and less Urban land than does the western part.

The high sand content of the soil, wind erosion, and tidal storms are the main limitations for residential development. Trafficability is difficult, and landscaping

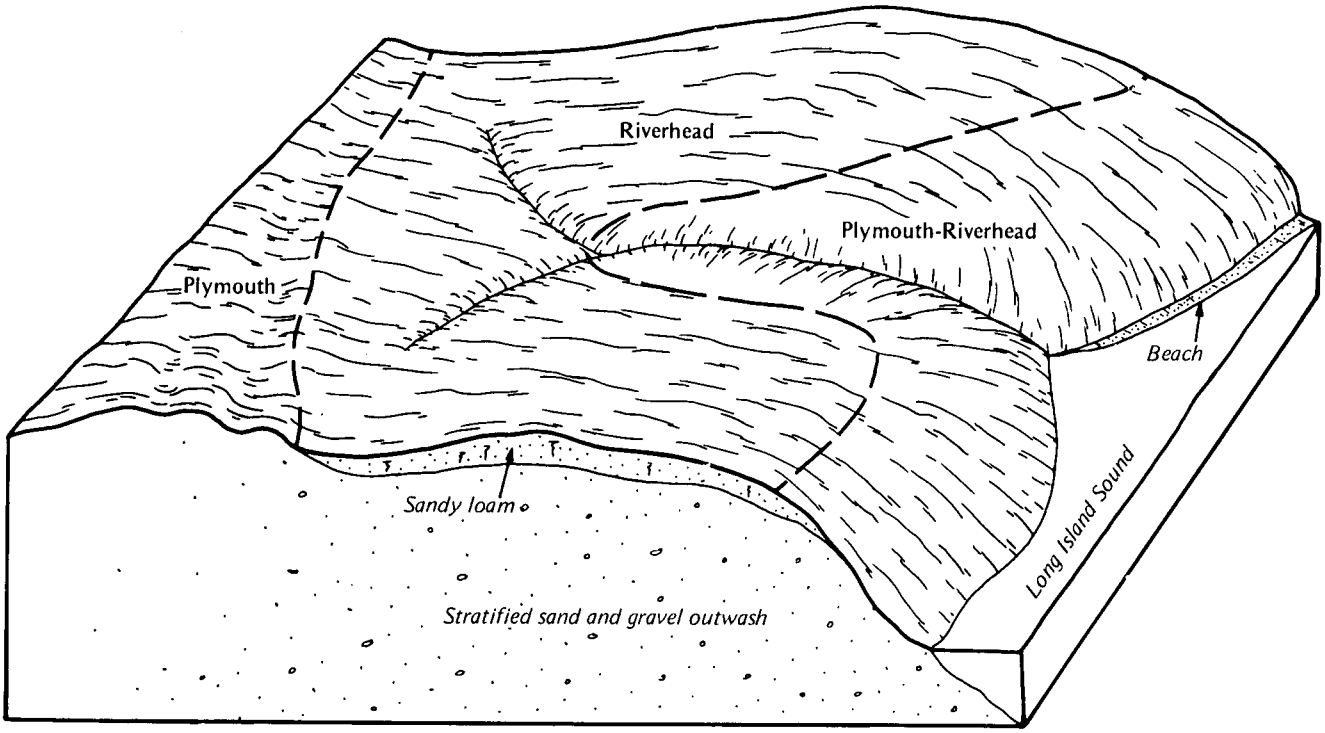

Figure 5.—Typical relationship of soils and underlying deposits in the Riverhead-Plymouth general soil map unit.

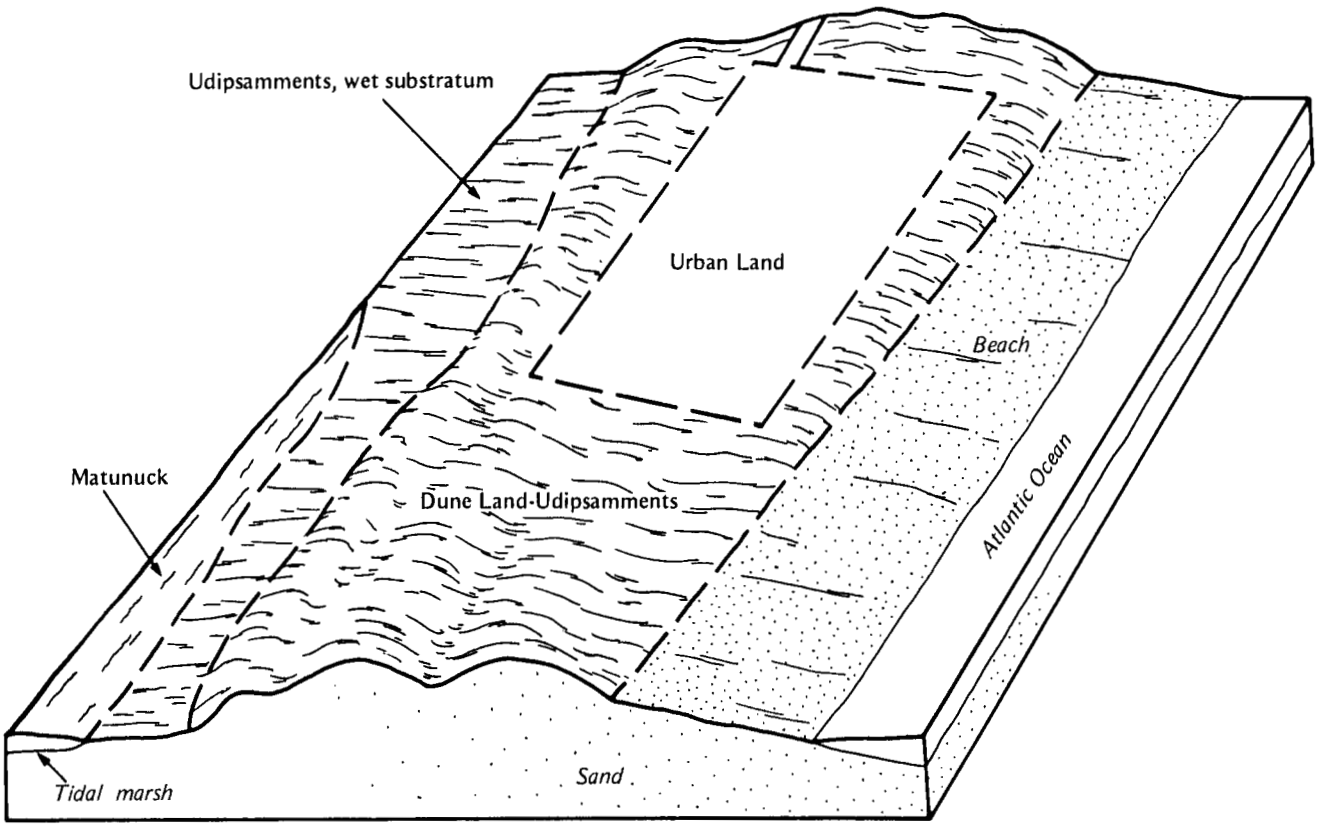

Figure 6.—Typical relationship of soils, surface features, and underlying deposits in the Udipsamments-Beaches-Urban land general soil map unit.

requires special measures, including the use of drought- and salt-tolerant plants. Many areas are subject to inundation from severe coastal storms.

The beaches are the main attraction for recreation. Any support facilities are subject to the same limitations that affect residential development.

6. Urban land

Dominantly nearly level or gently sloping areas that are covered by buildings, roads, sidewalks, and parking lots; on plains and low hills

This unit consists of urban areas where a high percentage of the surface is a manmade impervious cover. It is mostly in villages, cities, shopping plazas, and industrial parks and along commercial thoroughfares on plains and near the shore. A small part of the unit is in hilly areas in the northern part of the county. Slope ranges from 0 to 8 percent but dominantly ranges from 0 to 5 percent.

This unit makes up about 10 percent of the survey area. The unit is about 85 percent Urban land and 15 percent minor soils.

The areas of Urban land consist of buildings, roads, parking lots, driveways, and other similar features.

Of minor extent are well drained Hempstead, Enfield, and Riverhead soils in open fields, yards, or gardens near residential areas. A few areas of Udipsamments with a wet substratum and a few areas of poorly drained Atsion soils are in open drainageways and low areas.

Very few undisturbed sites are in this unit. Most of the precipitation falling on this unit is channeled through storm sewers into ground-water recharge basins. Near the south shore, the runoff is carried directly to streams that enter the Atlantic Ocean.

7. Urban land-Hempstead

Dominantly Urban land and nearly level, well drained, medium-textured soils; on plains

This general soil map unit consists of urban areas and very deep soils on a plain in the central part of the county that is bounded on the north and east by low hills. This plain is crossed by narrow drainageways that carry runoff to the south shore of Nassau County. Slope is dominantly 0 to 3 percent.

This unit makes up about 10 percent of the county. The unit is about 65 percent Urban land, 25 percent Hempstead soils, and 10 percent soils of minor extent.

The Urban land consists of buildings, roads, driveways, parking lots, and other manmade features that make up an impervious manmade cover on the surface. Most of the precipitation on these areas is channeled through storm sewers into ground-water recharge basins.

The Hempstead soils are in most of the open land areas, mainly parks, border strips along parkways, and lawns and playgrounds in residential areas. The soils have a surface layer of black silt loam. The upper part of the subsoil is dark brown silt loam, and the lower part is yellowish brown silt loam. The substratum is well sorted sand and gravel.

Of minor extent are moderately well drained Mineola soils along drainageways, well drained Enfield soils in areas that have a light-colored surface layer, and areas of excessively drained to moderately well drained Udipsamments where underlying sand and gravel have been mixed into the soil surface or where sandy fill has been placed upon the original surface.

The few open areas in this unit are mostly in lawns, gardens, or playgrounds in residential areas. Some open areas are along parts of the parkway system and in parks where the cover is trees or grass and shrubs.

The open areas of Hempstead soils are generally suitable for residential development. The main limitation for roads, driveways, and sidewalks is a potential for frost action. The substratum in the Hempstead soils is a poor filter of effluent, and thus pollution is a hazard to the ground water.

The soils in this unit are well suited as sites for playgrounds and landscaping. The dominant soils have a high available water capacity and generally have a good supply of plant nutrients for lawns, ornamental shrubs, and trees.

8. Urban land-Montauk-Riverhead

Dominantly Urban land and nearly level to strongly sloping, well drained, medium-textured and moderately coarse textured soils; on low hills

This general soil map unit consists of urban areas and very deep soils. The steeper areas of the unit are along side slopes or sides of drainageways. The nearly level or undulating areas are on broad ridgecrests and hilltops and on foot slopes. A few short, mostly intermittent streams drain this unit. Slope dominantly ranges from 0 to 15 percent.

This unit makes up about 9 percent of the survey area. The unit is about 50 percent Urban land, 25 percent Montauk soils, 15 percent Riverhead soils, and 10 percent soils of minor extent.

The areas of Urban land consist of buildings, roads, driveways, parking lots, or other manmade features.

The Montauk soils have a surface layer of dark grayish brown silt loam. The subsoil is yellowish brown gravelly loam and sandy loam. The substratum is light yellowish brown, firm gravelly loamy sand. Water moves slowly or moderately slowly through the substratum.

The Riverhead soils have a surface layer of brown sandy loam. The subsoil is strong brown and yellowish brown fine sandy loam. The substratum is brownish yellow sand and gravelly sand.

Of minor extent are moderately well drained Scio soils on foot slopes, very poorly drained Manahawkin and Freetown soils in bogs, and very poorly drained Matunuck soils in tidal areas.

Most of the acreage of this unit is in urban use. The open soil areas are mostly in lawns, gardens, or playgrounds in residential areas. Some residential areas have large wooded lots. There are a few moderately large wooded tracts, mostly in areas of very poorly drained soils.

Onsite sewage disposal is limited in the Montauk soils because of the moderately slow or slow permeability in the substratum. Generally, the Riverhead soils are suitable for homesites, but in places slope limits building and the substratum is a poor filter of effluent, causing a pollution hazard to the ground water. A potential for frost action is a hazard to roads, driveways, and sidewalks. On much of the acreage of the minor soils wetness is a limitation for homesites.

The main limitations of the soils in this unit for use as playgrounds are slope in some areas and small stones in the surface layer.

The small stones and the slope are also limitations for landscaping. Normally, these soils are strongly acid and require substantial amounts of lime and fertilizer.

9. Urban land-Riverhead

Dominantly Urban land and nearly level, well drained, moderately coarse textured soils; on plains

This general soil map unit consists of urban areas and very deep soils. This unit is mostly on a plain crossed by a few narrow drainageways which carry surface runoff to the south shore. Slope dominantly ranges from 0 to 3 percent.

This unit makes up about 20.5 percent of the county. The unit is about 68 percent Urban land, 17 percent Riverhead soils, and 15 percent soils of minor extent.

The areas of Urban land consist of buildings, roads, driveways, parking lots, and other manmade features. Much of the precipitation on this part of the unit is collected and channeled through storm sewers into ground-water recharge basins or directly into nearby stream drainageways.

The Riverhead soils occupy most of the open land. They have a surface layer of brown sandy loam. The subsoil is strong brown and yellowish brown sandy loam. The substratum is brownish yellow sand and gravelly sand.

Figure 7.—Typical landscape of Urban land-Udipsamments-Sudbury general soil map unit along the south shore of Nassau County.

Of minor extent are moderately well drained Sudbury soils in low areas, poorly drained Atsion soils in wet drainage troughs, well drained Enfield soils where the soil has a high silt content, and excessively drained to moderately well drained Udipsamments in areas where underlying sand has been mixed with the surface layer or placed on the original surface.

Most of the acreage of this unit is in urban use. The open areas are mostly in lawns, gardens, or playgrounds near residential areas. Some areas are along parts of the parkway system where the cover is trees or landscaped grass and shrubs.

The open areas of the Riverhead soils are generally suitable for residential development. The main limitation for roads, driveways, and sidewalks is a potential for frost action. Also, the substratum is a poor filter of septic effluent, causing a pollution hazard to the ground water.

The Riverhead soils are suitable for such purposes as picnic areas, playgrounds, or paths and trails. These soils normally are strongly acid or very strongly acid and have moderate available water capacity.

10. Urban land-Udipsamments-Sudbury

Dominantly Urban land and nearly level, excessively drained to moderately well drained, coarse-textured and moderately coarse textured soils; on plains

This general soil map unit consists of urban areas and very deep soils. The landscape is a low plain that extends to bays on the south shore of the county. Drainageways separate the areas from the interior of the island. Slope ranges from 0 to 3 percent.

This unit makes up about 11.2 percent of the county. The unit is about 60 percent Urban land, 20 percent Udipsamments, 10 percent Sudbury soils, and 10 percent soils of minor extent (fig. 7).

The areas of Urban land consist of buildings, roads, driveways, parking lots, and other manmade features.

The Udipsamments are excessively drained to moderately well drained. They have a thin surface layer of dark grayish brown sandy loam. The subsoil is light brownish gray sand. The Udipsamments are in areas where the soil has been disturbed or mixed. Many areas are sandy fill material or are at the bottom of snallow excavations where the substratum is exposed. Some fill areas have marshy organic sediments in the substratum. A few small gravel fragments are common.

The Sudbury soils are moderately well drained. They are in relatively undisturbed open areas, most of which are near urban development. The Sudbury soils have a surface layer of brown fine sandy loam. The subsoil is yellowish brown sandy loam and loamy sand that is

mottled in the lower part. The substratum is a very pale brown, very gravelly loamy sand that is distinctly mottled.

Of minor extent are well drained Riverhead soils on knolls and very poorly drained Pawcatuck soils in tidal marshes.

Most of the acreage of this unit is in urban use. The open soil areas are mostly in lawns, gardens, playgrounds, and parks in residential areas. A few narrow strips of saltwater-tolerant plants are in adjacent shoreline tidal marshes.

In some of the Udipsamments, the substratum is wet, limiting them as a site for basements, and they are subject to subsidence. The Udipsamments are sandy, and using them for landscaping requires fertilizer, lime, and supplemental irrigation. The Sudbury soils are wet and thus are limited as sites for residences with basements. They also have potential for frost action.

For use as playgrounds, the main limitation of the Udipsamments is sand in the surface layer. Seasonal wetness is a limitation in the Sudbury soils.

Detailed Soil Map Units

The map units on the detailed soil maps at the back of this survey represent the soils in the survey area. The map unit descriptions in this section, along with the soil maps, can be used to determine the suitability and potential of a soil for specific uses. They also can be used to plan the management needed for those uses. More information on each map unit, or soil, is given under "Use and Management of the Soils."

Each map unit on the detailed soil maps represents an area on the landscape and consists of one or more soils for which the unit is named.

A symbol identifying the soil precedes the map unit name in the soil descriptions. Each description includes general facts about the soil and gives the principal hazards and limitations to be considered in planning for specific uses.

Soils that have profiles that are almost alike make up a *soil series*. Except for differences in texture of the surface layer or of the underlying material, all the soils of a series have major horizons that are similar in composition, thickness, and arrangement.

Soils of one series can differ in texture of the surface layer or of the underlying material. They also can differ in slope, stoniness, salinity, wetness, degree of erosion, and other characteristics that affect their use. On the basis of such differences, a soil series is divided into *soil phases*. Most of the areas shown on the detailed soil maps are phases of soil series. The name of a soil phase commonly indicates a feature that affects use or management. For example, Riverhead sandy loam, 0 to 3 percent slopes, is one of several phases in the Riverhead series.

Some map units are made up of two or more major soils or miscellaneous areas. These map units are called soil complexes.

A *soil complex* consists of two or more soils, or one or more soils and a miscellaneous area, in such an intricate pattern or in such small areas that they cannot be shown separately on the soil maps. The pattern and proportion of the soils are somewhat similar in all areas. Urban land-Hempstead complex is an example.

Most map units include small scattered areas of soils other than those for which the map unit is named. Some of these included soils have properties that differ substantially from those of the major soil or soils. Such differences could significantly affect use and management of the soils in the map unit. The included soils are identified in each map unit description. Some small areas of strongly contrasting soils are identified by a special symbol on the soil maps.

This survey includes *miscellaneous areas*. Such areas have little or no soil material and support little or no vegetation. Pits, sand and gravel, is an example. Miscellaneous areas are shown on the soil maps. Some that are too small to be shown are identified by a special symbol on the soil maps.

Table 4 gives the acreage and proportionate extent of each map unit. Other tables (see "Summary of Tables") give properties of the soils and the limitations, capabilities, and potentials for many uses. The Glossary defines many of the terms used in describing the soils.

Soil Descriptions

At—Atsion loamy sand. This soil is very deep, nearly level, and poorly drained. It is along the bottom of stream drainageways. The areas of this soil are long and narrow or irregular in shape and range from 2 to 60 acres. Slope ranges from 0 to 2 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
- Surface to 2 inches, black muck with a thin mantle of leaf litter
- 2 to 5 inches, very dark gray loamy sand

Subsurface layer:
- 5 to 7 inches, grayish brown sand

Subsoil:
- 7 to 11 inches, black loamy sand
- 11 to 18 inches, dark reddish brown and reddish brown loamy sand
- 18 to 36 inches, dark grayish brown loamy sand

Substratum:
- 36 to 60 inches or more, light brownish gray coarse sand

Included with this soil in mapping are small areas of moderately well drained Sudbury soils and very poorly drained Berryland soils. The Sudbury soils are on small knolls, and the Berryland soils are in swales or very low

depressions. Each of these included areas makes up about 5 percent of the unit.

Soil properties—

Permeability: Rapid in the surface layer, moderately rapid in the upper part of the subsoil, and rapid in the lower part of the subsoil and in the substratum.
Available water capacity: Low.
Soil reaction: Very strongly acid or strongly acid.
Surface runoff: Very slow.
Erosion hazard: Slight.
Water table: Within 1 foot of the surface most of the time.
Root zone: Mostly within 1 foot of the soil surface.

Most areas of this soil are in woodland or mixed woodland and brushy wetland plants. Red maple is a common tree species.

The water table is the major limitation of this soil as a site for dwellings with or without basements, for septic effluent disposal, for local roads and streets, or for landscaping. Drainage is necessary but is difficult to achieve because the water table is so close to the surface and there is a lack of suitable outlets. Pollution of the water table is a hazard in areas used for septic effluent disposal. Wetness-tolerant plants and shrubs are needed for landscaping.

The water table is also the major limitation of the soil for most types of recreation development. The muck in the surface layer is sticky when wet, and the subsoil is sandy. Both of those factors limit recreation uses.

This soil has fair suitability for wildlife habitat.

Bc—Beaches. This unit consists of strips of nearly level or gently sloping sand or sand and gravel. These areas are inundated twice each day with saltwater at high tide. Wind and tides move much of the material, especially the sand, and most of the areas have no plant cover.

The beaches along the south shore bordering the Atlantic Ocean are the widest and are primarily sand. They are in a nearly straight east-west strip broken only at the Jones Inlet. The beaches along the north shore bordering Long Island Sound are narrower and generally contain more gravel, cobbles, and shell fragments. Because the north-shore coastline is incised with many harbors and bays, many of the areas are in small strips, and some are inclusions at the edge of adjacent more sloping soils.

Beaches are used intensively for sunbathing and other related recreation activities (fig. 8). Location and the daily tidal flooding make most other uses impractical.

Bd—Berryland mucky loamy sand. This soil is very deep, nearly level, and very poorly drained. It is in

Figure 8.—Beaches in Nassau County.

drainageways and swampy areas that are wet most of the year. The areas of the soil mostly are irregular in shape or long and narrow and range from 5 to 50 acres. Slope ranges from 0 to 1 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
Surface to 5 inches, black muck covered by a thin layer of partially decomposed leaves

Subsurface layer:
5 to 8 inches, light gray loamy sand

Subsoil:
8 to 10 inches, dark reddish brown loamy sand
10 to 17 inches, dark reddish brown loamy sand
17 to 27 inches, dark reddish brown loamy coarse sand
27 to 33 inches, dark brown gravelly coarse sand

Substratum:
33 to 60 inches, grayish brown very gravelly sand

Included with this soil in mapping are small areas of poorly drained Atsion soils and very poorly drained Manahawkin soils. The Atsion soils are on higher benches in various parts of the unit and make up 10 percent of the unit. The Manahawkin soils are in spots where the surface layer is organic material thicker than 16 inches. They make up about 5 percent of the unit.

Soil properties—

Permeability: Rapid in the surface layer, moderately rapid in the subsoil, and moderately rapid or rapid in the substratum.
Available water capacity: Low.
Soil reaction: Extremely acid or very strongly acid in the surface layer and subsoil; strongly acid or very strongly acid in the substratum.
Surface runoff: Very slow.
Erosion hazard: Slight.
Water table: Within 6 inches of the surface most of the year.
Root zone: Within 6 inches of the surface most of the year.

Most areas of this soil are in a native plant cover consisting of water-tolerant trees and brush. A few areas are in sedges and cattails.

The water table is the major limitation of this soil as a site for dwellings with or without basements, septic effluent disposal, local roads and streets, recreation development, and landscaping. A lack of suitable outlets makes drainage difficult to establish. Pollution of the water table is a hazard in areas used for septic systems, even if sand beds are used. Large amounts of fill are needed to raise roads and streets above the water table and to avoid frost heaving, and fill is needed in nearly all recreation areas. Plants and shrubs used for landscaping must tolerate wetness.

This soil is poorly suited to most types of openland and woodland wildlife habitat but is well suited to wetland wildlife habitat.

Du—Duneland-Udipsamments complex. This unit is made up of mounds and knolls of wind-deposited sand. The unit is adjacent to beaches and sometimes is partially inundated by exceptionally high tides produced by storms. The Duneland has little or no plant cover, and thus is subject to wind erosion. A plant cover of beach grasses and scrub protects the Udipsamments from wind erosion. Most areas of the unit are nearly level or undulating. Slope ranges from 0 to 8 percent. The areas mainly are long and narrow and range from 5 to 100 acres. They consist of about 50 percent Duneland; 45 percent very deep, excessively drained Udipsamments; and 5 percent other soils. The Duneland and Udipsamments are so intermingled that it was not practical to map them separately.

Duneland generally is light gray sand from the surface to a depth of 60 inches or more. The upper part has pieces of undecomposed plants mixed with the sand (fig. 9).

Udipsamments commonly have a surface layer of grayish brown loamy sand about 4 inches thick. The substratum is light gray sand to a depth of at least 60 inches.

Included with this unit in mapping are spots of very poorly drained Matunuck soils and a few areas of soils that are moderately well drained. In total, these inclusions make up about 5 percent of the unit.

Soil properties—

Permeability: Rapid
Water table: Usually at a depth of 4 feet or more but influenced by tidal action.
Available water capacity: Very low.
Runoff: Slow.

Most of these areas are owned by the State or by local municipalities and are used as satellite areas for beach-front recreation.

Flooding and damage from severe coastal storms are the major limitations of the unit as a site for dwellings with or without basements.

A hazard of pollution to the local water table and nearby estuaries is the main limitation for septic effluent disposal.

The sandy texture limits the soils as a site for local streets and roads and for recreation development. The soils shift under foot traffic, and unprotected areas are susceptible to wind erosion. Loamy soil material is needed to stabilize playgrounds.

Figure 9.—Typical landscape of Duneland-Udipsamments complex. Udipsamments are the low, nearly level areas in the foreground, and Duneland is in the background.

The sand content makes these soils droughty and low in natural fertility, and thus the unit is limited for landscaping. Topsoil, appropriate plant nutrients, and irrigation are needed to improve the suitability, but in most instances the unit will not support plant species with low salt tolerance.

This unit is poorly suited to openland and woodland wildlife habitat and very poorly suited to wetland wildlife habitat.

EnA—Enfield silt loam, 0 to 3 percent slopes. This soil is very deep, nearly level, and well drained. It is on plains and broad terraces. The areas are oval, round, or irregular in shape and range from 5 to 100 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
Surface to 10 inches, dark brown silt loam

Subsoil:
10 to 32 inches, yellowish brown silt loam
32 to 36 inches, brown gravelly loamy sand

Substratum:
36 to 60 inches or more, light yellowish brown very gravelly sand

Included with this soil in mapping are small areas of well drained Riverhead soils and moderately well drained Scio soils. The Riverhead soils are on convex benches on slightly higher parts of the landscape and make up about 10 percent of the unit. The Scio soils are in some low sags and make up about 5 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and subsoil; rapid and very rapid in the substratum.
Available water capacity: High.
Soil reaction: Very strongly acid to moderately acid.
Surface runoff: Slow.
Erosion hazard: Slight to moderate.
Water table: At a depth of more than 6 feet.
Root zone: To a depth of 40 inches or more.

Most areas of this soil are low-density residential or commercial areas. Some areas are in native grasses, and a few are used for crops or horse farms.

This soil has few limitations as a site for dwellings with or without basements or for septic effluent disposal. The permeability in the substratum makes the soil a poor filter in areas used for septic systems and causes a hazard of pollution to the water table.

Frost action is a hazard for local streets and roads on this soil. Using roadside ditches to remove surface runoff and adding a coarse-grained material to the road subgrade will reduce the potential for frost action and the subsequent damage.

This soil has few limitations for recreation development or landscaping. Surface shaping is needed to reduce runoff on some high-use recreation areas, and erosion is a hazard on paths and trails. Unprotected landscape areas are subject to erosion during intense rainstorms.

This soil is well suited to openland or woodland and very poorly suited to wetland wildlife habitat.

EnB—Enfield silt loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and well drained. It is on the sides of terraces and on the foot slopes of steeper hillsides. A few areas are undulating. Most of the areas are long and narrow or irregular in shape and range mainly from 5 to 100 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
Surface to 10 inches, dark brown silt loam

Subsoil:
10 to 32 inches, yellowish brown silt loam
32 to 36 inches, brown gravelly loamy sand

Substratum:
36 to 60 inches or more, light yellowish brown very gravelly sand

Included with this soil in mapping are small areas of well drained Montauk and Riverhead soils and moderately well drained Scio soils. The Montauk soils are throughout the unit and make up about 10 percent of the unit. The Riverhead soils are on knolls throughout this unit and make up about 5 percent of the unit. The Scio soils are in low areas where surface water collects or is removed slowly. They make up about 5 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and subsoil; rapid and very rapid in the substratum.
Available water capacity: High.
Soil reaction: Very strongly acid to moderately acid throughout.
Erosion hazard: Moderate.
Water table: At a depth of more than 6 feet.
Root zone: To a depth of 40 inches or more.

Some areas of this unit are used for crops, some for horse farms, some for low-density residential or commercial use, and some for native grasses.

This soil has few limitations for dwellings with or without basements or for septic effluent disposal. Erosion is a hazard during construction if much of the plant cover is removed, and the permeability in the substratum causes a hazard of pollution to the water table in areas used as sites for septic systems.

Frost action is the main limitation of the soil as a site for local streets and roads. Coarse-grained material is needed in the road subgrade to reduce frost heaving and subsequent damage. Roadside ditches and cut slopes are susceptible to erosion. Baseline pavement in ditch bottoms and sod cover on ditch banks are generally needed.

Slope and erosion limit the soil for recreation development. Development of athletic fields requires extensive grading in many instances. Intensive use of playing fields and other similar facilities causes compaction of the soil, which results in puddling on the surface layer, prolonged surface wetness, and increased erosion.

This soil has few limitations for landscaping. Unprotected areas erode readily.

This soil is well suited to openland and woodland wildlife habitat and very poorly suited to wetland wildlife habitat.

Fr—Freetown muck. This soil is very deep, level, and very poorly drained. It is in broad depressions. Most of this soil is in one round area. The slope is less than 1 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
Surface to 7 inches, black muck

Subsurface and bottom layers:
7 to 60 inches or more, dark reddish brown muck

Included with this soil in mapping are small areas of very poorly drained Manahawkin soils in which the organic deposits are less than 51 inches thick. These areas make up less than 5 percent of the unit.

Soil properties—

Permeability: Moderate to moderately rapid throughout.
Available water capacity: High.
Soil reaction: Extremely acid throughout.
Surface runoff: Very slow or ponded.
Erosion hazard: Slight.

Water table: At the surface during seasonally wet periods.
Root zone: To a depth of 40 inches or more or to the water table.

Practically all the acreage of this soil is in woodland. Most of it is in one area near Kings Point.

Prolonged wetness, ponding, and low strength of the organic material are major limitations of the soil as a site for dwellings with or without basements.

Seasonal wetness and the organic material limit this soil as a site for septic effluent disposal. These limitations are difficult to overcome without the use of suitable mineral fill. There is a hazard of pollution to the water table in areas used as sites for septic systems.

The seasonal wetness, the low strength, and frost action limit this soil as a site for local streets and roads. Use of suitable fill material is essential to overcome these limitations. The organic layers of this soil are highly susceptible to subsidence.

The seasonal wetness and organic material are major limitations of the soil for recreation development. Any such use requires adequate mineral fill to elevate the site.

The seasonal wetness makes landscaping on this soil nearly impractical.

This soil is poorly suited to openland and woodland wildlife habitat but well suited to wetland wildlife habitat.

He—Hempstead silt loam. This soil is very deep and well drained. It is mostly on plains or along the edges of broad terraces. The areas are square, rectangular, or long and narrow and conform to land-use boundaries in most instances. They range from 5 acres to long, narrow strips of several hundred acres. Slope ranges from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
Surface to 11 inches, black silt loam

Subsurface layer:
11 to 15 inches, dark brown silt loam

Subsoil:
15 to 29 inches, yellowish brown silt loam
29 to 33 inches, strong brown very gravelly loamy sand

Substratum:
33 to 60 inches or more, very pale brown sand and gravel

Included with this soil in mapping are small areas of well drained Enfield soils, moderately well drained Mineola soils, and excessively drained to moderately well drained Udipsamments. The Enfield soils make up about 10 percent of the unit. The Mineola soils are in drainage troughs and make up about 5 percent of the unit. The Udipsamments are in areas where the upper layers of the soil are high in sand content, commonly in playgrounds where grading has introduced sandy material into the surface layer. The Udipsamments make up about 5 percent of the unit. Also included are a few areas of Hempstead soils with slope of more than 3 percent along the sides of drainageways.

Soil properties—

Permeability: Moderate in the surface layer, subsurface layer, and upper part of the subsoil; rapid in the lower part of the subsoil and very rapid in the substratum.
Available water capacity: High.
Soil reaction: Moderately acid to very strongly acid in the surface layer, subsurface layer, and subsoil; strongly acid or very strongly acid in the substratum.
Surface runoff: Slow.
Erosion hazard: Slight.
Water table: At a depth of more than 6 feet.
Root zone: To a depth of 40 inches or more.

Practically all areas of this soil are in parks, playgrounds, athletic fields, and golf courses and along the right-of-way of the parkway system. Grass covers most of the areas, and shrubs or trees are on a few areas. Most of the parkway right-of-way is wooded or landscaped with grass and shrubs.

This soil has few limitations as a site for dwellings with or without basements, but frost action is a hazard to sidewalks and driveways. Replacing the surface layer with coarse-grained material will help to reduce frost action.

The soil has few limitations as a site for septic effluent disposal. The substratum is a poor filter, however, causing a hazard of pollution to the ground water. The frost action is the main limitation of the soil as a site for local streets and roads. Drainage of surface water and use of coarse-grained material for subgrade will reduce the hazard of frost action.

For recreation development this soil has few limitations. Compaction of intensively used areas increases wetness at the surface and increases erosion.

Although the surface layer mainly is acid, this soil generally has a good natural supply of plant nutrients and available water and is generally suitable for landscaping.

This soil is well suited to openland and woodland wildlife habitat and very poorly suited to wetland wildlife habitat. The proximity of this soil to residential areas and high-speed roadways limits some development of wildlife habitat.

Ip—Ipswich mucky peat. This soil is very deep and very poorly drained. It is near the ocean in tidal marshes

that are inundated by saltwater twice daily (fig. 10). The areas are round or irregular in shape and range from 3 to several hundred acres. The larger areas are separate islands in the bays adjacent to the Atlantic Ocean. Slope is less than 1 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
Surface to 4 inches, dark grayish brown mucky peat

Subsurface layer:
4 to 21 inches, black mucky peat
21 to 36 inches, very dark brown mucky peat
36 to 60 inches or more, dark olive gray muck

Included with this soil in mapping are small areas of Udipsamments and very poorly drained Pawcatuck soils. The Udipsamments are dredged sandy material deposited in tidal bogs. They make up about 5 percent of the unit. The Pawcatuck soils are mainly adjacent to dunes and make up about 5 percent of the unit.

Soil properties—

Permeability: Moderate to rapid throughout.
Available water capacity: High
Soil reaction: Moderately acid to mildly alkaline throughout.
Surface runoff: Very slow or ponded.
Erosion hazard: Moderate at bog edges due to wave action.
Water table: Tidal inundation twice dach day.
Root zone: To a depth of about 40 inches or more for saltwater-tolerant species.

Most of the acreage of this soil is in saltwater-tolerant grasses and sedges.

Low strength in the organic material and the daily tidal flooding are the major limitations of this soil as a site for dwellings, septic effluent disposal, local roads and streets, recreation development, and landscaping. Mineral fill material is needed to make the soil suitable for most of those uses, but subsidence is a hazard to structures that are not specially designed and pollution is a hazard to estuaries in areas used for septic disposal.

This soil is very poorly suited to openland and woodland wildlife habitat but is well suited to habitat for wetland wildlife such as ducks or geese.

Ma—Manahawkin muck. This soil is very deep and very poorly drained. It is in depressions along drainageways or in low basins. The areas are long and narrow or irregular in shape and range mainly from 5 to 40 acres. Slope is less than 1 percent.

Figure 10.—Typical landscape and profile of Ipswich mucky peat.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
Surface to 7 inches, very dark gray muck

Subsurface layer:
7 to 24 inches, black muck
24 to 28 inches, very dark gray muck
28 to 36 inches, black mucky peat

Substratum:
36 to 60 inches or more, light brownish gray sand

Included with this soil in mapping are small areas of very poorly drained Berryland and Freetown soils. The Berryland soils are in spots where the underlying mineral material is within 16 inches of the surface, and the Freetown soils are in areas where the underlying mineral soil is at a depth of more than 51 inches. Each of these soils makes up from 5 to 10 percent of this unit.

Soil properties—

Permeability: Moderate or moderately rapid in the surface layer and subsurface layer; moderately rapid or rapid in the substratum.
Available water capacity: High.
Soil reaction: Strongly acid or very strongly acid throughout.
Surface runoff: Very slow or ponded.
Erosion hazard: Slight.
Water table: At the surface or ponded up to 1 foot above the surface during seasonally wet periods.
Root zone: To a depth of about 34 inches or at the normal low depth of the water table.

Practically all of this soil is in woodland, much of which is in municipal parks. A few areas are in brush and cattails.

Wetness, frequent flooding, and low strength are major limitations of this soil as a site for dwellings with or without basements. Very few drainage outlets exist. Suitable fill material to elevate the site and proper design to compensate for or overcome subsidence are essential.

The wetness and flooding limit the soil as a site for septic effluent disposal, and pollution is a hazard to the regional water table.

The wetness, flooding, and low strength and a frost-action potential limit this soil as a site for local streets and roads. Fill usually is necessary to raise the road above the water table and the flood level. Subsidence and frost heaving are hazards if too much organic material is in the subgrade.

The flooding, wetness, and organic material limit the soil for recreation development or landscaping. Any recreation use will require adequate fill to elevate the site. During drought periods, the organic layers of this soil that dry out are combustible.

This soil is very poorly suited to openland and woodland wildlife habitat but has fair suitability for wetland wildlife habitat.

Mc—Matunuck mucky peat. This soil is very deep and very poorly drained. It is in tidal areas that are inundated by saltwater twice daily. The areas are long and narrow or irregular in shape and range from 2 to 30 acres. Slope is 0 to 1 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
Surface to 8 inches, very dark gray mucky peat

Substratum:
8 to 12 inches, gray sand
12 to 60 inches or more, light olive gray sand

Included with this soil in mapping are small areas of very poorly drained Pawcatuck soils and sandy areas with no organic matter or only a thin cover of organic matter. The Pawcatuck soils are in spots where the organic layer is more than 16 inches thick, and they make up as much as 10 percent of the unit. The sandy areas make up about 5 to 10 percent of the unit.

Soil properties—

Permeability: Rapid in the surface layer and very rapid in the substratum.
Available water capacity: Moderate.
Soil reaction: Strongly acid to neutral throughout.
Surface runoff: Very slow or ponded.
Erosion hazard: Moderate at bog edges due to wave action.
Water table: Tidal inundation twice each day brings the water table to the surface.
Root zone: To a depth of 40 inches for saltwater-tolerant species.

Most areas of this soil are in saltwater-tolerant sedges and grasses.

Prolonged wetness and tidal flooding are major limitations of this soil for dwellings with or without basements and for local roads and streets. Any use of this soil will require enough fill to elevate the site above tidal flooding. The areas of Pawcatuck are especially susceptible to subsidence.

The wetness and flooding are major limitations of the soil as a site for septic effluent disposal. Pollution is a hazard for the estuaries adjacent to this soil.

The wetness, the flooding, and the organic material limit recreation development on this soil. For any such use adequate fill material will be required, and the areas will require maintenance to prevent wet spots from

developing. Subsidence is likely to affect athletic fields if they are placed on inclusions of Pawcatuck soils.

The wetness and flooding limit landscaping on this soil.

This soil is very poorly suited to openland and woodland wildlife habitat but is well suited to wetland wildlife habitat.

MfA—Montauk fine sandy loam, 0 to 3 percent slopes. This soil is very deep, nearly level, and well drained. It is on the tops of benches and on broad hills and ridgetops. The areas are round or irregular in shape. They range from 3 to 100 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
Surface to 7 inches, dark grayish brown fine sandy loam

Subsoil:
7 to 19 inches, strong brown fine sandy loam
19 to 28 inches, yellowish brown fine sandy loam
28 to 34 inches, light yellowish brown sandy loam

Substratum:
34 to 47 inches, pale brown, firm loamy sand
47 to 60 inches or more, light yellowish brown, firm gravelly loamy sand

Included with this soil in mapping are small areas of well drained Riverhead soils and moderately well drained Scio soils. The Riverhead soils are in spots where the substratum is loose or friable. They make up about 10 percent of the unit. The Scio soils are in low areas that are slightly wet and make up 5 percent of the unit.

Soil properties—

Permeability: Moderate to moderately rapid in the surface layer and subsoil; slow or moderately slow in the substratum.
Available water capacity: Moderate.
Soil reaction: Extremely acid to moderately acid throughout.
Surface runoff: Slow to medium.
Erosion hazard: Slight.
Water table: Perched at a depth of 2 to 2.5 feet during seasonally wet periods.
Root zone: To a depth of about 30 inches.

A few areas of this soil are used for horse farms and vegetable crops, but most are in low-density housing or grass cover.

Seasonal wetness is the main limitation of this soil as a site for dwellings with or without basements. The substratum restricts the downward movement of water. Foundation drains and waterproofing help to control the hazard of wetness in basements.

The seasonal wetness and the permeability in the substratum are major limitations of this soil as a site for septic effluent disposal. Using a special design or enlarging the filter field often is necessary to overcome those limitations, and onsite investigation commonly is needed to determine if more permeable layers are below the substratum. The areas of included Riverhead soils are more permeable than this Montauk soil.

The seasonal wetness and frost action are the main limitations of the soil as a site for local roads and streets. Roadside drainage helps to overcome those limitations.

Seasonal wetness and small stones in the surface layer are the main limitations of the soil for recreation development. The wetness is a limitation for campsites and picnic areas, and the stones are a limitation for playgrounds. Removing the stones or adding a layer of stone-free loamy material will improve the suitability for playgrounds.

This soil is generally suitable for landscaping, but in places stones must be removed from the surface layer.

This soil generally is well suited to openland and woodland wildlife habitat but is very poorly suited to wetland wildlife habitat.

MfB—Montauk fine sandy loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and well drained. It is on benches, side slopes of hills, and tops of small knolls and ridges. Most areas are round, oval, or irregular in shape. The areas range mainly from 5 to 100 acres, but a few areas are several hundred acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
Surface to 7 inches, dark grayish brown fine sandy loam

Subsoil:
7 to 19 inches, strong brown fine sandy loam
19 to 28 inches, yellowish brown fine sandy loam
28 to 34 inches, light yellowish brown sandy loam

Substratum:
34 to 47 inches, pale brown, firm loamy sand
47 to 60 inches or more, light yellowish brown, firm gravelly loamy sand

Included with this soil in mapping are small areas of moderately well drained Riverhead and Scio soils. The Riverhead soils are in spots where the substratum is loose or friable, and they make up about 5 percent of the unit. The Scio soils are in a few low spots that receive runoff and are slightly wet. They make up as much as 10 percent of the unit. Some of these spots are ponded during very wet periods.

Soil properties—

Permeability: Moderate to moderately rapid in the surface layer and subsoil; slow or moderately slow in the substratum.
Available water capacity: Moderate.
Soil reaction: Extremely acid to moderately acid throughout.
Surface runoff: Medium.
Erosion hazard: Slight to moderate.
Water table: Perched at a depth of 2 to 2.5 feet during seasonally wet periods.
Root zone: To a depth of about 30 inches.

A few areas of this soil are in horse farms or vegetable farms. Some areas are in native vegetation, and some are used for low-density housing.

Seasonal wetness is the main limitation of this soil as a site for dwellings with or without basements. The substratum restricts the downward movement of water. Foundation drains and waterproofing help to control the hazard of wetness in basements.

The seasonal wetness and the permeability in the substratum are major limitations of this soil as a site for septic effluent disposal. Using a special design or enlarging the filter field often is necessary to overcome those limitations, and onsite investigation commonly is needed to determine if more permeable layers are below the substratum. The areas of included Riverhead soils are more permeable than this Montauk soil.

The seasonal wetness and frost action are the main limitations of the soil as a site for local roads and streets. Roadside drainage helps to overcome those limitations.

Seasonal wetness and small stones in the surface layer are the main limitations of the soil for recreation development. The wetness is a limitation for campsites and picnic areas, and the stones are a limitation for playgrounds. Removing the stones or adding a layer of stone-free loamy material will improve the suitability for playgrounds. Playgrounds on this soil require some grading to lessen the slope, but grading is likely to expose gravel or cobblestones.

This soil is generally suitable for landscaping, but in places stones must be removed from the surface layer.

This soil generally is well suited to openland and woodland wildlife habitat but is very poorly suited to wetland wildlife habitat.

MfC—Montauk fine sandy loam, 8 to 15 percent slopes. This soil is very deep, strongly sloping, and well drained. It is on the sides of small hills and ridges. A few areas of this soil are rolling, or the slope is in different directions within short distances. Most areas are irregular in shape or long and narrow. The areas range mainly from 5 to 100 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
Surface to 7 inches, dark grayish brown fine sandy loam

Subsoil:
7 to 19 inches, strong brown fine sandy loam
19 to 28 inches, yellowish brown fine sandy loam
28 to 34 inches, light yellowish brown sandy loam

Substratum:
34 to 47 inches, pale brown, firm loamy sand
47 to 60 inches or more, light yellowish brown, firm gravelly loamy sand

Included with this soil in mapping are small areas of well drained Riverhead soils, moderately well drained Scio soils, and somewhat poorly drained and poorly drained Wallington soils. The Riverhead soils are in areas where the substratum is loose or friable. They make up about 10 percent of the unit. The Scio and Wallington soils are in low flat areas or depressions and make up about 5 percent of this unit. Small ponds are in the lowest parts of some of the depressions for part of the year. Montauk soils with slope of less than 8 percent make up another 5 to 10 percent of some areas and are mainly on narrow ridge crests.

Soil properties—

Permeability: Moderate to moderately rapid in the surface layer and subsoil; slow or moderately slow in the substratum.
Available water capacity: Moderate.
Soil reaction: Extremely acid to moderately acid throughout.
Surface runoff: Medium.
Erosion hazard: Moderate.
Water table: Perched at a depth of 2 to 2.5 feet during seasonally wet periods.
Root zone: To a depth of about 30 inches.

Most areas of this soil are in woodland. Some are in pasture grasses, and others are in native vegetation. Some areas are used for low-density housing.

Seasonal wetness and slope limit the soil as a site for dwellings with or without basements. The substratum restricts the downward movement of water. Using foundation drains and interceptor drains will help reduce wetness or dampness in basements. Grading will overcome the slope, but designing the structure to fit the landscape will reduce the amount of grading needed. Erosion is a hazard on areas where the plant cover is removed during grading. Using a cover of mulch on these areas will help to reduce erosion.

The seasonal wetness and the permeability in the substratum are major limitations of this soil as a site for septic effluent disposal. Using a special design or enlarging the filter field often is necessary to overcome those limitations, and onsite investigation commonly is

needed to determine if more permeable layers are below the substratum. The areas of included Riverhead soils are more permeable than this Montauk soil. The slope of the soil makes design alterations necessary, and the soil must be protected against erosion.

Slope, seasonal wetness, and frost action limit the soil as a site for local streets and roads. Constructing roads on the contour helps to overcome the slope. Roadside drainage helps reduce the wetness and the potential for frost action. On some excavated roadbanks and shoulder ditches, a plant cover or special structures are required to control erosion.

Slope, the permeability in the substratum, and small stones in the soil limit this soil for recreation development. Some included low spots are seasonally wet and require subsurface drainage. Slope limits the soil as a site for playgrounds, and removal of small stones is needed on some playing surfaces. Placing camping facilities and picnic areas on the contour will minimize the slope, and interceptor drains will minimize wetness caused by the permeability in the substratum. Some graded surfaces need stone removal and a veneer of topsoil to support a desirable grass cover.

Slope limits the soil for landscaping. In some areas gravel and stones in the surface layer limit landscaping.

This soil is generally well suited to openland and woodland wildlife habitat and very poorly suited to wetland wildlife habitat.

MfD—Montauk fine sandy loam, 15 to 25 percent slopes. This soil is very deep, moderately steep, and well drained. It is on the sides of hills and ridges. Some areas are hilly and have an irregular slope configuration. The areas of this soil are round, long and narrow, or irregular in shape and range from 5 to 75 acres.

Typically, this Montauk soil is covered with a thin layer of partially decomposed leaves and twigs. Under this layer, the typical sequence, depth, and composition of the layers of the soil are as follows—

Surface layer:
Mineral surface to 7 inches, dark grayish brown fine sandy loam

Subsoil:
7 to 19 inches, strong brown fine sandy loam
19 to 28 inches, yellowish brown fine sandy loam
28 to 34 inches, light yellowish brown sandy loam

Substratum:
34 to 47 inches, pale brown, firm loamy sand
47 to 60 inches or more, light yellowish brown, firm gravelly loamy sand

Included with this soil in mapping are small areas of well drained Riverhead soils and somewhat poorly drained and poorly drained Walpole soils. The Riverhead soils are in small areas where the substratum is loose or friable. They make up about 10 percent of the unit. The Walpole soils are in low pockets along shallow drainageways and on low foot slopes. They make up about 5 percent of the unit. Another 5 to 10 percent is small benchlike areas of Montauk soils with slope of 8 to 15 percent.

Soil properties—

Permeability: Moderate to moderately rapid in the surface layer and subsoil; slow or moderately slow in the substratum.
Available water capacity: Moderate.
Soil reaction: Extremely acid to moderately acid throughout.
Surface runoff: Rapid.
Erosion hazard: Severe.
Water table: Perched at a depth of 2 to 2.5 feet during very wet periods.
Root zone: To a depth of about 30 inches.

Most areas of this soil are in woodland. A few areas are in grass and brush. Some areas are in low-density housing.

Slope is the major limitation of this soil as a site for dwellings with or without basements. Land shaping and grading will help to overcome the slope, but designing the structure to conform to the natural landscape will reduce the amount of grading required. Erosion is a hazard where the ground cover is removed during construction. Establishing a plant cover as quickly as possible on graded areas will help to control erosion. Foundation drains and interceptor drains will reduce wetness and the hazard of wet basements during seasonally wet periods.

Slope and the permeability in the substratum are major limitations of this soil as a site for septic effluent disposal. Special design of filter fields is necessary to overcome these limitations. Onsite investigation is necessary in some areas to determine if more permeable layers are below the substratum. Erosion is a hazard on exposed areas.

Slope, seasonal wetness, and frost action limit the soil as a site for local streets and roads. Constructing roads on the contour helps to overcome the slope. Roadside drainage helps reduce the wetness and the potential for frost action. On some excavated roadbanks and shoulder ditches, a plant cover or special structures are required to control erosion.

Slope is the major limitation of this soil for recreation development. Placing paths and trails on the contour or across slope will help minimize the erosion hazard. Grading will likely expose numerous small stones and some large stones, and will increase erosion.

Slope and erosion limit this soil for landscaping. Grading operations are likely to expose gravel and numerous stones. Mulching material will probably be necessary to protect exposed areas from erosion.

This soil has fair to good suitability for openland and woodland wildlife habitat and is very poorly suited to wetland wildlife habitat.

MkA—Montauk silt loam, 0 to 3 percent slopes. This soil is very deep, nearly level, and well drained. It is on flat benches or the tops of broad low hills. The areas are round, roughly square, or irregular in shape and range mainly from 3 to 100 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
Surface to 9 inches, dark grayish brown silt loam

Subsoil:
9 to 15 inches, yellowish brown silt loam
15 to 22 inches, yellowish brown loam
22 to 31 inches, pale brown fine sandy loam

Substratum:
31 to 38 inches, light brown and olive brown, firm loamy sand
38 to 43 inches, light brownish gray, firm loamy sand
43 to 60 inches or more, light gray and reddish brown, firm gravelly loamy sand

Included with this soil in mapping are small areas of well drained Enfield and Riverhead soils and moderately well drained Scio soils. The Enfield and Riverhead soils are in areas where the substratum is loose or friable. The Enfield soils make up about 10 percent of the unit and the Riverhead soils about 5 percent. Some areas of both of these soils have firm layers very deep in the soil. The Scio soils are in small sags or low spots that are slightly wet. They make up about 5 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and subsoil; slow or moderately slow in the substratum.
Available water capacity: Moderate to high.
Soil reaction: Extremely acid to moderately acid throughout.
Surface runoff: Medium to slow.
Erosion hazard: Slight.
Water table: Perched at a depth of 2 to 2.5 feet for brief periods in wet seasons.
Root zone: To a depth of about 30 inches.

Some areas of this soil are used for farm crops. Some areas are used for low-density housing.

Seasonal wetness is the main limitation of this soil as a site for dwellings with or without basements. The substratum restricts the downward movement of water. Foundation drains and waterproofing help to control the hazard of wetness in basements.

The seasonal wetness and the permeability in the substratum are major limitations of this soil as a site for septic effluent dispoal. Using a special design or enlarging the filter field often is necessary to overcome those limitations, and onsite investigation commonly is needed to determine if more permeable layers are below the substratum. The areas of included Riverhead soils are more permeable than this Montauk soil.

Seasonal wetness and frost action limit this soil as a site for local streets and roads. Roadside drainage will reduce wetness and the frost section. The addition of coarse grained material to the road subgrade also will reduce the potential for frost heaving and subsequent damage.

Seasonal wetness limits the soil for recreation development, especially in intensively used areas. Coarse grained material often is needed in these areas to help keep the surface dry.

This soil is generally suitable for landscaping, but exposed areas are subject to erosion during intense rainstorms.

This soil is generally well suited to openland and woodland wildlife habitat and very poorly suited to most types of wetland wildlife habitat.

MkB—Montauk silt loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and well drained. It is on the sides of benches, on low ridges and knolls, and on the foot slopes of steep hillsides. A few areas are undulating. The areas of this soil are mainly rectangular or round and range mainly from 3 to 100 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
Surface to 9 inches, dark grayish brown silt loam

Subsoil:
9 to 15 inches, yellowish brown silt loam
15 to 22 inches, yellowish brown loam
22 to 31 inches, pale brown fine sandy loam

Substratum:
31 to 38 inches, light brown and olive brown, firm loamy sand
38 to 43 inches, light brownish gray, firm loamy sand
43 to 60 inches or more, light gray and reddish brown, firm gravelly loamy sand

Included with this soil in mapping are small areas of well drained Enfield and Riverhead soils that each make up about 5 to 10 percent of this unit. Both of these soils commonly have firm layers deep in the substratum, but the upper part of the substratum is loose and permeable. Also included are moderately well drained Scio soils that are in sags or shallow drainageways and that make up about 5 percent of the unit. A few small depressions contain intermittent small ponds. Some of these are shown on the map with a spot symbol.

Soil properties—

Permeability: Moderate in the surface layer and subsoil; slow or moderately slow in the substratum.
Available water capacity: Moderate to high.
Soil reaction: Extremely acid to moderately acid throughout.
Surface runoff: Medium.
Erosion hazard: Moderate.
Water table: Perched at a depth of 2 to 2.5 feet briefly during seasonally wet periods.
Root zone: To a depth of about 30 inches.

Some areas of this soil are used for farm crops. Some areas are used for low-density housing.

Seasonal wetness is the main limitation of this soil as a site for dwellings with or without basements. The substratum restricts the downward movement of water. Foundation drains and waterproofing help to control the hazard of wetness in basements.

The seasonal wetness and the permeability in the substratum are major limitations of this soil as a site for septic effluent disposal. Using a special design or enlarging the filter field often is necessary to overcome those limitations, and onsite investigation commonly is needed to determine if more permeable layers are below the substratum. The areas of included Riverhead soils are more permeable than this Montauk soil.

Seasonal wetness and frost action limit this soil as a site for local streets and roads. Roadside drainage will reduce wetness and subsequent frost heaving, and the addition of coarse grained material to the road subgrade will reduce the potential for frost action. Road embankments and ditch areas on this soil are subject to erosion. A plant cover is needed on some banks and excavated areas to control erosion, and structures are needed for sediment and erosion control in some critical sections of drainage ditches.

Wetness, slope, and erosion limit this soil for recreation developments. Athletic fields require extensive grading in many areas. Exposed areas of this soil need a plant cover after grading to control erosion. Playing fields and other facilities that are subject to intensive use or heavy foot traffic are compacted and have water on or near the surface. Aerating these areas or using a layer of sandy soil will help to control wetness (fig. 11).

This soil has few limitations for landscaping. Unprotected areas are subject to erosion during intense rainstorms. Maintaining a plant cover or using mulch helps to control erosion. Some low areas are subject to

Figure 11.—Typical landscape of Montauk silt loam, 3 to 8 percent slopes. Wet spots, such as the dark area on the right, are common in this unit.

ponding after heavy rains, and filling and grading are necessary.

This soil is well suited to openland and woodland wildlife habitat and very poorly suited to wetland wildlife habitat.

Pa—Pawcatuck mucky peat. This soil is very deep and very poorly drained. It is in tidal marshes that are inundated by saltwater twice daily. The areas are long and narrow or irregular in shape and range from 3 to 100 acres. The slope range is less than 1 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
Surface to 8 inches, very dark grayish brown mucky peat

Subsurface layer:
8 to 12 inches, very dark gray mucky peat
12 to 33 inches, black mucky peat

Substratum:
33 to 60 inches, dark gray loamy sand

Included with this soil in mapping are small areas of very poorly drained Matunuck and Ipswich soils and excessively drained to moderately well drained Udipsamments. The Matunuck soils are in spots where the organic deposits are thin, and Ipswich soils are where the organic layers are thicker than 51 inches. The Udipsamments are dredged or tide-deposited sand in the tidal marsh. Each of the included soils makes up about 5 to 10 percent of this unit.

Soil properties—

Permeability: Moderate to rapid in the surface and subsurface layers; very rapid in the substratum.
Available water capacity: High.
Soil reaction: Strongly acid to mildly alkaline throughout.
Surface runoff: Very slow or ponded.
Erosion hazard: Moderate at the marsh edge due to wave action.
Water table: Tidal inundation twice each day brings the water table to the surface or just above the surface.
Root zone: To a depth of about 40 inches for saltwater-tolerant species.

Most areas of this soil are in saltwater-tolerant grasses, sedges, or brush.

Low strength in the organic material and the daily tidal flooding are the major limitations of this soil as a site for dwellings, septic effluent disposal, local roads and streets, recreation development, and landscaping. Mineral fill material is needed to make the soil suitable for most of those uses, but subsidence is a hazard to structures that are not specially designed and pollution is a hazard to estuaries in areas used for septic disposal.

This soil is very poorly suited to openland and woodland wildlife habitat but is well suited to habitat for wetland wildlife such as ducks or geese.

Pg—Pits, ground-water recharge. This unit consists of basins used for the disposal of runoff from streets, parking lots, and buildings. These units act as reservoirs that allow the runoff to infiltrate into the soil and recharge the ground-water supply. These pits have steep sides and nearly level bottoms.

Some of the pits are dry most of the time because the collected water rapidly infiltrates into the soil, while others contain water for long periods. A pit with standing water indicates that the water table is at a shallow depth, the pit bottom is sealed with fine soil material, or the pit bottom is slowly permeable material (fig. 12). Pits of less than 1 acre are indicated on the soil maps with a special spot symbol.

Onsite investigation is needed to determine the suitability and limitations of this unit for any use.

Pk—Pits, sand and gravel. This unit consists of areas from which sand and gravel have been removed. Excavation of sand and gravel is still carried on in most pits. Parts of some larger pits are idle. The sides of the pits are generally steep, and the floor is nearly level. Piles of stones and boulders commonly are on the floor. Some of the deeply excavated pits are partially filled with water. The shape of the areas depends on ownership boundaries. The areas range from 10 to 100 acres.

These pits are generally devoid of vegetation, but some older pits have a sparse growth of trees, brush, grass, and weeds. The vegetation generally is stunted because the soil material is droughty and very low in natural fertility. Permeability mainly is very rapid, and the water table is at various depths.

Onsite investigation is needed to determine the limitations and potentials of this unit for any use.

PlB—Plymouth loamy sand, 3 to 8 percent slopes. This soil is very deep, gently sloping, and excessively drained. It is on the tops of broad ridges, at the upper edge of benches, and on undulating plains. The areas are round or irregularly shaped. They range from 2 to 25 acres. Slopes mainly are convex.

A thin layer of leaves commonly is on the surface of this soil. The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
Surface to 5 inches, dark brown loamy sand

Subsoil:
5 to 13 inches, strong brown loamy sand
13 to 26 inches, yellowish brown loamy sand

Substratum:

Figure 12.—An area of Pits, ground-water recharge.

26 to 42 inches, brownish yellow gravelly sand
42 to 60 inches or more, pale yellow gravelly coarse sand

Included with this soil in mapping are small areas of Riverhead soils and nearly level or sloping Plymouth soils. These included soils make up 5 to 10 percent of the unit.

Soil properties—

Permeability: Rapid in the surface layer and subsoil; very rapid in the substratum.
Available water capacity: Very low.
Soil reaction: Very strongly acid or strongly acid throughout.
Surface runoff: Slow.
Erosion hazard: Slight.
Water table: At a depth of more than 6 feet.
Root zone: To a depth of 40 inches or more.

About half the acreage of this soil is in woodland. Some areas are in grass or grass-brush cover, and some are in low-density housing.

This soil is generally suitable as a site for dwellings with or without basements and for local roads and streets, but the substratum is a poor filter for septic effluent disposal and causes a hazard of pollution to the ground water.

This soil has few limitations for most recreation uses, although the sand in the soil hinders trafficability on trails and in picnic areas. Slope and a few small stones in the surface layer are limitations for playgrounds. Grading generally is required to develop athletic fields or playgrounds.

The sand and droughtiness and low fertility are the main limitations of this soil for landscaping. A loamy topsoil, fertilizer, and irrigation are usually necessary for establishing and maintaining lawns and shrubbery.

This soil is poorly suited to openland wildlife habitat and very poorly suited to woodland and wetland wildlife habitat.

PIC—Plymouth loamy sand, 8 to 15 percent slopes. This soil is very deep, strongly sloping, and excessively drained. It is along the side slopes of drainageways and on hillsides and sides of ridges. Most of the areas are in long, narrow strips, but some are irregular in shape. The areas range from 4 to 40 acres. Most slopes are short and convex.

A thin layer of leaves commonly is on this soil. The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
Surface to 5 inches, dark brown loamy sand

Subsoil:
5 to 13 inches, strong brown loamy sand
13 to 26 inches, yellowish brown loamy sand

Substratum:
26 to 42 inches, brownish yellow gravelly sand
42 to 60 inches or more, pale yellow gravelly coarse sand

Included with this soil in mapping are small areas of Riverhead soil. Also included are small narrow strips of Plymouth soils that have slopes of less than 8 percent or more than 15 percent. The included soils make up about 10 percent of the unit.

Soil properties—

Permeability: Rapid in the surface layer and subsoil; very rapid in the substratum.
Available water capacity: Very low.
Soil reaction: Very strongly acid or strongly acid throughout.
Surface runoff: Slow to medium.
Erosion hazard: Moderate.
Water table: At a depth of more than 6 feet.
Root zone: To a depth of 40 inches or more.

More than half of the acreage of this soil is in woodland. Some areas are in a grass and brush cover, and some are in low-density housing.

Slope is the main limitation of the soil as a site for dwellings with or without basement. Erosion is a hazard if the plant cover is removed. Establishing a plant cover on exposed areas as soon as construction is completed will reduce the erosion hazard.

Slope and the permeability limit the soil as a site for septic effluent disposal. The permeability causes a hazard of pollution to the ground water.

Slope is the main limitation of the soil as a site for local streets and roads. Placing roads across the slope and using mulch or a plant cover on roadside ditches help to prevent erosion.

Slope limits the soil for many recreation uses, especially for playgrounds because of the amount of grading required. The sandy texture hinders trafficability in some areas, and a loamy topsoil is needed in such areas.

Droughtiness and low fertility are the main limitations of the soil for landscaping. Topsoil, mulch, fertilizers, and irrigation are needed in some areas to establish and maintain lawns and shrubs.

This soil is poorly suited to openland wildlife habitat and very poorly suited to woodland and wetland wildlife habitat.

PrD—Plymouth-Riverhead complex, 15 to 35 percent slopes. This unit consists of very deep, moderately steep and steep soils on side slopes of hills and ridges. The Plymouth soils are on the convex steep parts, and the Riverhead soils are on the concave moderately steep parts. Commonly, this unit is near the side slopes of deep drainageways. The areas of this unit range from 5 to 100 acres. They are about 50 percent excessively drained Plymouth soils, 40 percent well drained Riverhead soils, and 10 percent other soils. The Plymouth and Riverhead soils are so intermingled that it was not practical to map them separately.

A thin layer of leaves commonly is on the surface of the Plymouth soils. The typical sequence, depth, and composition of the layers of the Plymouth soils are as follows—

Surface layer:
Surface to 5 inches, dark brown loamy sand

Subsoil:
5 to 13 inches, strong brown loamy sand
13 to 26 inches, yellowish brown loamy sand

Substratum:
26 to 42 inches, brownish yellow gravelly sand
42 to 60 inches, pale yellow gravelly coarse sand

A thin layer of leaves and twigs commonly covers the surface of the Riverhead soils. The typical sequence, depth, and composition of the layers of the Riverhead soils are as follows—

Surface layer:
Surface to 3 inches, brown sandy loam

Subsoil:
3 to 8 inches, strong brown fine sandy loam
8 to 17 inches, yellowish brown fine sandy loam
17 to 24 inches, yellowish brown sandy loam
24 to 35 inches, brownish yellow loamy sand

Substratum:

35 to 52 inches, brownish yellow sand
52 to 60 inches or more, brownish yellow gravelly sand

Included with this unit in mapping are well drained Montauk soils with a dense and firm substratum and moderately well drained Sudbury soils on foot slopes and along drainageways. Also included are small areas with slopes of less than 15 percent and a few spots with stones on the surface.

Soil properties—

Permeability: Plymouth soils—rapid in the surface layer and subsoil; very rapid in the substratum. Riverhead soils—moderately rapid in the surface layer and subsoil; very rapid in the substratum.
Available water capacity: Plymouth soils—very low. Riverhead soils—moderate.
Soil reaction: Very strongly acid or strongly acid in both soils.
Surface runoff: Medium to rapid on both soils.
Erosion hazard: Severe for both soils.
Water table: At a depth of more than 6 feet in both soils.
Root zone: To a depth of 40 inches or more in both soils.

Most areas of this soil are in woodland. A few areas are in low-density housing.

Slope is a major limitation of the soil as a site for dwellings with or without basements, and erosion is a hazard in areas with no plant cover. Maintaining the original plant cover or establishing a plant cover during construction or soon after construction is completed will reduce erosion.

Slope and the poor filtering capacity of the substratum are the main limitations of the soils as a site for septic effluent disposal. The poor filtration causes a hazard of pollution to the ground water.

Slope limits this soil for most types of recreation development, but the limitation is only moderate for paths and trails on the moderately steep parts of this unit and any type of development is more suitable if placed on the contour or on the less sloping parts of the unit. In the Plymouth soils the high sand content hinders trafficability along paths and trails. Use of the soils for playgrounds generally requires extensive land grading.

Slope is the major limitation of the unit for landscaping. The Plymouth soils are droughty and very low in natural fertility. Landscaping projects usually require topsoil, mulch, and fertilizer. Irrigation is critical to new plants, especially those on south-facing slopes.

These soils have fair to poor suitability as a habitat for openland wildlife. They are very poorly suited to wetland wildlife habitat.

RdA—Riverhead sandy loam, 0 to 3 percent slopes. This soil is very deep, nearly level, and well drained. It is on the tops of benches and ridges and on broad plains. The areas are round or irregularly shaped and range from 5 to 100 acres.

Typically, the soil is covered by a thin layer of leaf litter and partly decomposed organic material. The typical sequence, depth, and compositon of the layers of the soil are as follows—

Surface layer:
Mineral surface to 3 inches, brown sandy loam.

Subsoil:
3 to 8 inches, strong brown fine sandy loam
8 to 17 inches, yellowish brown fine sandy loam
17 to 24 inches, yellowish brown sandy loam
24 to 35 inches, brownish yellow loamy sand

Substratum:
35 to 52 inches, brownish yellow sand
52 to 60 inches or more, brownish yellow gravelly sand

Included with this soil in mapping are small areas of excessively drained Plymouth soils and well drained Montauk soils. The Plymouth soils are in spots where the subsoil is thin, and the Montauk soils are in areas where lenses of dense soil material are in the substratum. These soils each make up about 5 percent of the unit.

Soil properties—

Permeability: Moderately rapid in the surface layer and subsoil; very rapid in the substratum.
Available water capacity: Moderate.
Soil reaction: Very strongly acid or strongly acid throughout.
Surface runoff: Slow.
Erosion hazard: Slight.
Water table: At a depth of more than 6 feet.
Root zone: To a depth of 40 inches or more.

Some areas of this soil are in low-density housing or a grass cover. The rest are in wooodland.

The soil has few limitations as a site for dwellings with or without basement and for septic effluent disposal. In areas used for septic systems, however, pollution is a hazard to the ground water because the substratum is a poor filter of effluent.

Frost action is the main limitation of the soil as a site for local streets and roads. Removing the loamy mantle and replacing it with coarse-grained material will help eliminate frost heaving.

This soil is generally suitable for most types of recreation development, especially athletic fields.

Droughtiness is a limitation in some years for establishing lawns and shrubs, and irrigation is essential during those years.

This soil is well suited to openland and woodland wildlife habitat and very poorly suited to wetland wildlife habitat.

RdB—Riverhead sandy loam, 3 to 8 percent slopes. This soil is very deep, gently sloping, and well drained. It is on bench shoulders and the tops of small knolls and hills. Some areas are undulating. Most areas are round, oval, or irregularly shaped and range from 5 to 100 acres.

Typically, the soil is covered by a thin cover of leaf litter and partly decomposed organic material. The typical sequence, depth, and composition of the layers of the soil are as follows—

Surface layer:
Mineral surface to 3 inches, brown sandy loam

Subsoil:
3 to 8 inches, strong brown fine sandy loam
8 to 17 inches, yellowish brown fine sandy loam
17 to 24 inches, yellowish brown sandy loam
24 to 35 inches, brownish yellow loamy sand

Substratum:
35 to 52 inches, brownish yellow sand
52 to 60 inches or more, brownish yellow gravelly sand

Included with this soil in mapping are small areas of excessively drained Plymouth soils and well drained Montauk soils. The Plymouth soils are at the crests of small knolls and at the edges of benches. The Montauk soils are in areas where lenses of dense soil material are in the substratum. These soils each make up about 5 percent of the unit.

Soil properties—

Permeability: Moderately rapid in the surface layer and subsoil; very rapid in the substratum.
Available water capacity: Moderate.
Soil reaction: Very strongly acid or strongly acid throughout.
Surface runoff: Slow to medium.
Erosion hazard: Slight.
Water table: At a depth of more than 6 feet.
Root zone: To a depth of 40 inches or more.

Some areas of this soil are in low-density housing or in a grass cover. The other parts are in woodland.

The soil has few limitations as a site for dwellings with or without basement and for septic effluent disposal. In areas used for septic systems, however, pollution is a hazard to the ground water because the substratum is a poor filter of effluent.

Frost action is the main limitation of the soil as a site for local streets and roads. Removing the loamy mantle and replacing it with coarse-grained material will help eliminate frost heaving.

This soil has few limitations for most types of recreation development, but grading is needed for playgrounds.

This soil has few limitations for landscaping. Droughtiness is a limitation in some years for establishing lawns and shrubs, and irrigation is essential during those years.

This soil is well suited to openland and woodland wildlife habitat and very poorly suited to wetland types of habitat.

RdC—Riverhead sandy loam, 8 to 15 percent slopes. This soil is very deep, strongly sloping, and well drained. It is in bands along the sides of benches and plains and is along the sides of drainageways. In some areas near the north shore, this soil is more rolling or irregular in slope configuration. The areas of this soil are irregularly shaped and range from a few acres to as much as 200 acres.

Typically, the soil is covered by a thin cover of leaf litter and partly decomposed organic material. The typical sequence, depth, and composition of the layers of the soil are as follows—

Surface layer:
Mineral surface to 3 inches, brown sandy loam

Subsoil:
3 to 8 inches, strong brown fine sandy loam
8 to 17 inches, yellowish brown fine sandy loam
17 to 24 inches, yellowish brown sandy loam
24 to 35 inches, brownish yellow loamy sand

Substratum:
35 to 52 inches, brownish yellow sand
52 to 60 inches or more, brownish yellow gravelly sand

Included with this soil in mapping are small areas of well drained Enfield and Montauk soils and excessively drained Plymouth soils. The Enfield soils are near the base of side slopes where the subsoil is more silty than that in this Riverhead soil. They make up 10 percent of the unit. The Plymouth soils are on the crests of knolls where the subsoil has a high sand content. They make up 5 percent of the unit. The Montauk soils are in areas where the substratum is more compact than in this Riverhead soil. They make up about 5 percent of the unit.

Soil properties—

Permeability: Moderately rapid in the surface layer and subsoil; very rapid in the substratum.
Available water capacity: Moderate.

Soil reaction: Very strongly acid or strongly acid throughout.
Surface runoff: Medium.
Erosion hazard: Moderate.
Water table: At a depth of more than 6 feet.
Root zone: To a depth of 40 inches or more.

Most areas of this soil are in woodland. Some of the other uses are pasture, horse farms, a brushy cover, and low-density housing.

Slope is the main limitation of the soil as a site for dwellings with or without basements. Land shaping and grading will help to overcome the slope. Erosion is a hazard in areas cleared for construction, however, so designing dwellings to conform to the natural setting will help keep land shaping to a minimum and thus reduce erosion. Establishing a plant cover as soon as construction is completed will also reduce erosion.

Slope and the permeability of the substratum limit the soil as a site for septic effluent disposal. Establishing a plant cover on the areas where the plant cover has been removed during installation of effluent disposal systems will reduce or control erosion. Pollution is a hazard to the ground water because of the poor filtering capacity of the substratum.

Slope and frost action limit this soil as a site for local streets and roads. Constructing the roads on the contour as much as possible will help overcome the slope. Erosion is a hazard on cut slopes and along road shoulder ditches. Critical eroding areas will need special treatment or structures. Replacing the loamy mantle of this soil with coarse-grained material will help reduce frost heaving.

Slope limits this soil for most types of recreation developments, especially playgrounds. Paths and trails and camping facilities can be arranged along slope contours to minimize the amount of land shaping required.

Slope and erosion limit this soil for landscaping. Mulching is necessary in some exposed areas to reduce or control erosion. Irrigation is necessary in some dry years to help ensure survival of new lawns and shrubs.

This soil is well suited to openland and woodland wildlife habitat and very poorly suited to wetland wildlife habitat.

RdD—Riverhead sandy loam, 15 to 25 percent slopes. This soil is very deep, moderately steep, and well drained. It is on the sides of hills and ridges and on side slopes adjacent to entrenched drainageways. A few areas are hilly or more irregular in slope configuration. The areas of this unit are long and narrow or irregular in shape and range from 5 to 40 acres.

Typically, the soil is covered by a thin cover of leaf litter and partly decomposed organic material. The typical sequence, depth, and composition of the layers of the soil are as follows—

Surface layer:
Mineral surface to 3 inches, brown sandy loam.

Subsoil:
3 to 8 inches, strong brown fine sandy loam
8 to 17 inches, yellowish brown fine sandy loam
17 to 24 inches, yellowish brown sandy loam
24 to 35 inches, brownish yellow loamy sand

Substratum:
35 to 52 inches, brownish yellow sand
52 to 60 inches or more, brownish yellow gravelly sand

Included with this soil in mapping are small areas of well drained Enfield and Montauk soils and excessively drained Plymouth soils. The Enfield soils are near the base of side slopes where the subsoil is more silty than that in this Riverhead soil. They make up 10 percent of the unit. The Plymouth soils are on the crests of knolls where the subsoil has a high sand content. They make up 5 percent of the unit. The Montauk soils are in areas where the substratum is more compact than in this Riverhead soil. They make up about 5 percent of the unit.

Soil properties—

Permeability: Moderately rapid in the surface layer and subsoil; very rapid in the substratum.
Available water capacity: Moderate.
Soil reaction: Very strongly acid or strongly acid throughout.
Surface runoff: Medium to rapid.
Erosion hazard: Severe.
Water table: At a depth of more than 6 feet.
Root zone: To a depth of 40 inches or more.

Most of the acreage of this soil is in woodland. A few areas are in low density-housing.

Slope is the main limitation of the soil as a site for dwellings with or without basements. Land shaping and grading will help to overcome the slope. Erosion is a hazard in areas cleared for construction, however, so designing dwellings to conform to the natural setting will help keep land shaping to a minimum and thus reduce erosion. Establishing a plant cover as soon as construction is completed will also reduce erosion.

Slope and the permeability of the substratum limit the soil as a site for septic effluent disposal. Establishing a plant cover on the areas where the plant cover has been removed during installation of effluent disposal systems will reduce or control erosion. Pollution is a hazard to the ground water because of the poor filtering capacity of the substratum.

Slope is the major limitation of this soil as a site for local streets and roads. Building roads on the contour will help overcome the slope, but erosion is a hazard on

cut slopes and along roadside drainage ditches, and critical areas of erosion will need special measures.

Slope limits the soil for most types of recreation developments, especially those that require extensive areas of level ground. The slope is less limiting for paths and trails, but they require special measures on sections where erosion is a hazard.

Slope and erosion limit this soil for landscaping. Mulching is necessary in some exposed areas to reduce or control erosion. Irrigation is necessary in some dry years to help ensure survival of new lawns and shrubs.

This soil has fair to good suitability for openland and woodland wildlife habitat and very poor suitability for wetland wildlife habitat.

Sc—Scio silt loam. This soil is very deep, nearly level, and moderately well drained. Slope ranges from 0 to 3 percent. The areas are round or irregular in shape. They range from 3 to 35 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
Surface to 12 inches, dark grayish brown silt loam

Subsoil:
12 to 17 inches, yellowish brown silt loam
17 to 35 inches, distinctly mottled, brown silt loam

Substratum:
35 to 43 inches, mottled, light gray silt loam
43 to 60 inches or more, mottled, brown and pale brown silt loam

Included with this soil in mapping are small areas of well drained Enfield soils and somewhat poorly drained Wallington soils. The Enfield soils are on the slightly higher, convex parts of this unit and make up about 5 percent of the unit. The Wallington soils are in low depressions and swales and make up about 10 percent of the unit. In some areas sandy layers are in the subsoil.

Soil properties—

Permeability: Moderate throughout.
Available water capacity: High.
Soil reaction: Very strongly acid to moderately acid.
Surface runoff: Slow.
Erosion hazard: Slight to moderate.
Water table: A seasonal high water table is at a depth of 1.5 to 2 feet.
Root zone: To a depth of about 30 inches.

Some of the acreage of this soil is in vegetable farms or nurseries. Other areas are in a grass cover, and some are in low-density housing.

Seasonal wetness limits the soil as a site for dwellings, especially those with basements. Using foundation drains and sealing foundation walls will help overcome the wetness.

The seasonal high water table is a major limitation of this soil as a site for septic effluent disposal. In many instances the seasonal high water table can be controlled by drainage. The included areas of Enfield soil have few limitations for septic effluent disposal but provide poor filtering capacity. The included areas of Wallington soils also are limited by prolonged wetness, and the permeability is slow in the lower part of the subsoil.

Frost action limits this soil as a site for local streets and roads, and low strength is a limitation, especially when the soil is saturated. Installing drainage and providing coarser grained subgrade base material will help to overcome the frost action and low strength.

Seasonal wetness limits this soil for recreation development. Drainage or a veneer of loamy fill helps to alleviate the wetness.

Seasonal wetness limits this soil for landscaping, mainly by causing delays in grading, planting, and seeding until the soil dries. Otherwise, the soil is well suited to landscaping. In areas cleared of vegetation, soil splash during heavy rainstorms can result in some erosion.

This soil is well suited to openland and woodland wildlife habitat and poorly suited to wetland wildlife habitat.

SdA—Scio silt loam, till substratum, 0 to 3 percent slopes. This soil is very deep, nearly level, and moderately well drained. It is in low areas. The areas are round, oblong, or irregular in shape and range from 3 to 30 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows:

Surface layer:
Surface to 12 inches, dark grayish brown silt loam

Subsoil:
12 to 17 inches, dark yellowish brown silt loam
17 to 36 inches, distinctly mottled, brown silt loam

Substratum:
36 to 43 inches, light gray silt loam
43 to 60 inches or more, compact, mottled, brown gravelly loam

Included with this soil in mapping are small areas of well drained Montauk soils and somewhat poorly drained Wallington soils. The Montauk soils are in small convex areas in various parts of this unit and make up about 10 percent of the unit. The Wallington soils are in small wet depressions and make up 5 percent of the unit. Also included are small areas where the soil is loam or

gravelly loam in the subsoil. They make up about 10 percent of the unit.

Soil properties—

Permeability: Moderate in the surface layer and subsoil; moderately slow or slow in the substratum.
Available water capacity: High.
Soil reaction: Very strongly acid to moderately acid in the surface layer and subsoil; strongly acid or moderately acid in the substratum.
Surface runoff: Slow.
Erosion hazard: Slight to moderate.
Water table: A seasonal high water table is at a depth of 1.5 to 2 feet.

Most areas of this soil are in a grass cover or woodland. Some areas are in cropland, and others are in low-density housing.

Seasonal wetness limits the soil as a site for dwellings, especially those with basements. Using foundation drains and sealing foundation walls will help overcome the wetness.

Seasonal wetness and the permeability in the substratum limits this soil as a site for septic effluent disposal. Drainage around the effluent-disposal field helps to overcome wetness. The permeability results in poor performance of the septic system unless special design is used.

Frost action limits this soil as a site for local streets and roads, and low strength is a limitation, especially when the soil is saturated. Installing drainage and providing coarser grained subgrade base material will help to overcome the frost action and low strength.

Seasonal wetness limits this soil for recreation development. Drainage or a veneer of loamy fill helps to alleviate the wetness.

Seasonal wetness limits this soil for landscaping, mainly by causing delays in grading, planting, and seeding until the soil dries. Otherwise, the soil is well suited to landscaping purposes because of the high available water capacity. In areas cleared of vegetation, soil splash during heavy rainstorms can result in some erosion.

This soil is well suited to openland and woodland wildlife habitat and poorly suited to wetland wildlife habitat.

SdB—Scio silt loam, till substratum, 3 to 8 percent slopes. This soil is very deep and moderately well drained. It is on the lower portion of long, gentle slopes. Commonly, these areas are foot slopes adjacent to small hills or ridges. The areas are rectangular or irregular in shape. They range from 5 to 20 acres.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
Surface to 12 inches, dark grayish brown silt loam

Subsoil:
12 to 17 inches, yellowish brown silt loam
17 to 36 inches, distinctly mottled, brown silt loam

Substratum:
36 to 43 inches, light gray silt loam
43 to 60 inches or more, compact, mottled, brown gravelly loam

Included with this soil in mapping are small areas of well drained Montauk soils and somewhat poorly drained Wallington soils. The Montauk soils are on small knolls at the highest parts of this unit, and they make up about 10 percent of the unit. The Wallington soils are in seep spots or shallow drainageways and make up about 5 percent of the unit. In a few spots the substratum contains lenses of silty clay loam that is sticky when wet. Another 5 percent of the unit is areas where the slope is 8 to 15 percent.

Soil properties—

Permeability: Moderate in the surface layer and subsoil; moderately slow to slow in the substratum.
Available water capacity: High.
Soil reaction: Very strongly acid to moderately acid in the surface layer and subsoil; strongly acid or moderately acid in the substratum.
Surface runoff: Medium.
Erosion hazard: Moderate.
Water table: A seasonal high water table is at a depth of 1.5 to 2 feet.
Root zone: To a depth of about 30 inches.

Most areas of this soil are in woodland. Some are in a grass and brush cover, and some are in low-density housing.

Seasonal wetness is the main limitation of this soil as a site for dwellings, especially those with basements. Using foundation drains and sealing foundation walls will help overcome wetness. Some of the included areas of silty clay loam provide low strength for foundation support. This is caused by seep zones above the silty clay loam.

Seasonal wetness and the permeability in the substratum limits this soil as a site for septic effluent disposal. Drainage around the effluent-disposal field helps to overcome wetness. The permeability results in poor performance of the septic system unless special design is used.

Frost action limits this soil as a site for local streets and roads, and low strength is a limitation, especially when the soil is saturated. Installing drainage and providing coarser grained subgrade base material will help to overcome the frost action and low strength. The soil is highly susceptible to erosion along cutbanks and roadside ditches.

Seasonal wetness limits this soil for recreation development, and slope is an additional limitation for playgrounds, especially in areas where the slope is near 8 percent. Some included seep spots of Wallington soils need drainage or must be avoided.

Seasonal wetness limits this soil for landscaping, mainly by causing delays in grading, planting, and seeding until the soil dries. Otherwise, the soil is well suited to landscaping. In areas cleared of vegetation, soil splash during heavy rainstorms can result in some erosion.

This soil is well suited to openland and woodland wildlife habitat and very poorly suited to wetland wildlife habitat.

Su—Sudbury sandy loam. This soil is very deep and moderately well drained. It is along shallow drainageways. The areas are long and narrow or irregular in shape and range from 5 to 50 acres. Slopes are smooth, are slightly concave to convex, and range from 0 to 3 percent.

The typical sequence, depth, and composition of the layers of this soil are as follows—

Surface layer:
Surface to 5 inches, dark brown sandy loam

Subsoil:
5 to 18 inches, yellowish brown sandy loam
18 to 28 inches, mottled, yellowish brown gravelly loamy sand

Substratum:
28 to 40 inches, mottled, pale brown very gravelly sand
40 to 60 inches or more, very pale brown very gravelly sand

Included with this soil in mapping are small areas of excessively drained Plymouth soils and poorly drained Atsion and Walpole soils. The Plymouth soils are on small knolls and make up about 5 percent of the unit. The Atsion and Walpole soils are in small depressions or troughs. The Atsion soils make up about 5 percent of the unit and are mostly in the southern part of the county, and the Walpole soils make up about 5 percent and are mostly in the northern part. Also included are soils similar to this Sudbury soil, but they contain less gravel. They make up 5 percent of the unit.

Soil properties—

Permeability: Moderately rapid in the surface layer and upper part of the subsoil; moderately rapid or rapid in the lower part of the subsoil; and rapid in the substratum.
Available water capacity: Low.
Soil reaction: Extremely acid to moderately acid throughout.
Surface runoff: Slow.
Erosion hazard: Slight.
Water table: At a depth of 1.5 to 3 feet during seasonally wet periods.
Root zone: To a depth of 30 inches or more.

Most areas of this soil are in woodland, mainly as part of a municipal park or wildlife area or along the parkway system right-of-way. Near the north shore, most of the acreage of this soil is in private ownership and is wooded or in a brush-grass cover.

Seasonal wetness limits the soil as a site for dwellings, especially those with basements. Using foundation drains and sealing foundation walls will help overcome the wetness.

Seasonal wetness and poor filtering capacity are major limitations of the soil as a site for septic effluent disposal. During some wet periods, the water table rises into the lower part of the subsoil. Mounding or other special design of effluent-disposal fields is sometimes required to overcome this limitation. The poor filtering capacity causes a hazard of pollution to the ground-water table if filter fields are not specially designed.

The soil has few limitations for landscaping. Grading to shape athletic fields or for other uses can mix the soil and cause it to be more droughty than in its natural state, and in dry years this soil is droughty. The soil is very low in natural fertility. Therefore, plant nutrients and supplemental irrigation are sometimes needed when establishing and maintaining lawns and shrubs.

This soil is well suited to openland and woodland wildlife habitat and poorly suited to wetland wildlife habitat.

Ua—Udifluvents, rarely flooded. This unit consists of very deep, well drained and moderately well drained soils. They are on benches along major drainageways that are subject to rare flooding. Slopes range from 0 to 3 percent. Surface runoff and stream drainage flow through the drainageways and eventually into the bays on Long Island Sound. Most areas are long and narrow and range from 5 to 30 acres.

Commonly, Udifluvents have a surface layer of dark brown silt loam about 14 inches thick. The subsoil is dark yellowish brown sandy loam about 12 inches thick. The substratum is pale brown sand and gravel to a depth of 60 inches or more.

Included with these soils in mapping are spots of well drained Riverhead soils and excessively drained Udipsamments. They are not subject to flooding. The Riverhead soils are on small knolls on an otherwise nearly level landscape. The Udipsamments are where construction or road maintenance has caused the surface layer and subsoil to be very sandy. Each of these included soils makes up as much as 10 percent of the unit.

Soil properties—

Permeability: Moderately rapid in the surface layer and subsoil; rapid or very rapid in the substratum.
Water table: At a depth of 2 feet or more.
Available water capacity: Moderate to low.
Soil reaction: Very strongly acid or strongly acid throughout.
Runoff: Very slow.

Parts of this map unit are subject to overflow during intense storms. The frequency of this flooding is very low. The placement of roads and open drainage ditches influences the severity of the flooding on different parts of the unit.

Some areas of this unit are wooded, some are in brush, and some are in grass. In many of the areas a roadway and associated drainage ditch run the length of the unit. A few spots are used for homesites, but most of the houses are at a high position at the edge of the unit.

Flooding is major limitation of these soils as a site for dwellings with or without basements, and seasonal wetness in some areas is a limitation for dwellings with basements.

Seasonal wetness, flooding, and poor filtering capacity are major limitations of the soils as sites for septic effluent disposal.

Flooding limits the soils as sites for local streets and roads, making special design and construction necessary.

Flooding limits recreation development, and a lack of space prevents the development of some areas.

These soils generally have few limitations for landscaping.

Generally, these soils are well suited to openland and woodland wildlife habitat and poorly suited to wetland wildlife habitat. Some areas have potential as sites for small ponds.

UdA—Udipsamments, nearly level. This unit consists of manmade fills or borrow areas, most of which are grass-covered. In some areas the original soil material has been stripped and moved, and others consist of sandy fill material. Slope ranges from 0 to 3 percent. The soils are very deep and excessively drained to well drained.

Commonly, these soils have a surface layer of dark yellowish brown loamy sand about 3 inches thick. The substratum extends to a depth of 60 inches or more. It is layers of strong brown and brownish yellow sand or gravelly sand. Most of the differences in the layers are the result of grading.

Included with these soils in mapping are small areas of well drained Montauk, Riverhead, and Hempstead soils, excessively drained Plymouth soils, and moderately well drained Sudbury soils. These are in spots where grading or excavating did not obliterate the original soil. Generally only one of these soils is in a given area, and it makes up as much as 10 percent of that area. Also included are gently sloping or strongly sloping areas. These are mainly at the edge of the unit where the fill has been used to level an area in an otherwise more sloping terrain.

Soil properties—

Permeability: Rapid or very rapid.
Water table: At a depth of more than 6 feet.
Available water capacity: Very low.
Runoff: Very slow.

This unit generally has few limitations as a site for dwellings with or without basements or for local roads and streets.

In some areas used for septic effluent disposal, the main limitation is that the underlying material is Montauk soils that lack adequate permeability. In areas where cuts have been made into a loose sandy substratum or where fill has been placed over rapidly permeable or very rapidly permeable soil, pollution from septic effluent is a hazard to the ground water.

The high sand content and droughtiness limit recreation use. Some intensively used areas require a veneer of loamy soil to improve trafficability and to improve water holding capacity so that a plant cover can be established. New plants in most areas require fertilizers and irrigation.

Droughtiness and low natural fertility limit landscaping on this unit. In most areas new shrubs and grasses require topsoil, fertilizer, mulch, and irrigation.

This unit is poorly suited to openland and woodland wildlife habitat and very poorly suited to wetland wildlife habitat.

UdE—Udipsamments, steep. This unit consists of manmade areas of very sandy soils that have been exposed by excavation (fig. 13). These soils are very deep and excessively drained to well drained. These areas are mainly on back slopes or side walls. Slope ranges from 25 to 60 percent.

Commonly, these soils have a surface layer of brown loamy sand that is about 3 inches thick and that mostly is material graded from soils near the upper edge of the unit. The substratum extends to a depth of 60 inches or more. It is brownish yellow and vey pale brown sand or gravelly sand.

Included with this unit in mapping are small areas of loamy soil and a few areas with slope of less than 25 percent. These areas make up less than 5 percent of the unit.

Soil properties—

Permeability: Rapid.
Water table: At a depth of 6 feet or more; deeper near the top of the slope and shallower near the bottom.
Available water capacity: Very low.
Runoff: Rapid.

Figure 13.—Many areas of Udipsamments, steep, are adjacent to urban developments where the landscape has been graded.

Most areas of this unit have a cover of grass, weeds, or sparse brush. In some areas the cover is patchy because of rills or gullies that have developed.

Slope limits this unit as a site for septic effluent disposal, and pollution is a hazard to the ground water because the rapidly permeable material is a poor filter of effluent.

Slope is also the major limitation of the unit as a site for dwellings with or without basements, for local streets and roads, and for recreation use. A few dwelling sites are on less steep parts of the unit, but uncontrolled or unrestricted construction and grading will increase erosion. Placing paths or trails in narrow areas and across the slope as much as possible will minimize the erosion hazard.

Slope, the erosion hazard, and droughtiness and low fertility limit landscaping. Topsoil, plant nutrients, irrigation, and mulch are needed in most areas. During heavy saturating rains, the steeper parts of the unit have a tendency to slump.

This unit is very poorly suited to all types of wildlife habitat.

Ue—Udipsamments, wet substratum. This unit consists mainly of nearly level low areas that have been filled with sandy material dredged primarily from adjacent waterways. The fill consists of sand 3.5 to 8 feet thick mostly over organic tidal marsh sediments and a few inland freshwater marshes. These soils are well drained or moderately well drained and are very deep. Most areas are long and narrow and range from 5 to 100 acres. Slope ranges from 0 to 3 percent.

Commonly, these soils have a surface layer of grayish brown loamy sand about 4 inches thick. The substratum is light gray sand and extends to a depth of 55 inches. It is distinctly mottled below a depth of 35 inches. From a depth of 55 inches to 60 inches or more, it is black, partially decomposed mucky peat.

Included with these soils in mapping are areas where the sandy fill is less than 40 inches thick over the organic deposits. These areas are mostly somewhat poorly drained and are at the edge of the unit adjacent to tidal marshes or waterways. They make up 10 percent of many areas.

Soil properties—

Permeability: Rapid in the sandy layers; moderate in the underlying organic layers.
Water table: At a depth of 3.5 feet or more, often tidal-influenced.
Available water capacity: Very low.
Runoff: Very slow.

Beach grasses and bayberry or other salt-tolerant brush are on the highest parts of the unit, and reeds are on the lower parts. Many of the areas of these soils are state-owned and are along highway right-of-ways or are part of the barrier islands.

The water table in the substratum limits this unit as a site for septic effluent disposal. Pollution from effluent is

a hazard to the ground water or to water in adjacent tidal areas because the sandy material is a poor filter.

Settling and compaction of the organic layers limit the unit as a site for dwellings without basements, and the water table is a limitation for dwellings with basements. Some areas of these soils are limited by tidal flooding during intense coastal storms. The use of pilings helps to overcome or alleviate the settling and wetness.

Settling of the organic material is the main limitation of the soil as a site for local streets and roads. The rate of settlement varies with time and the amount of organic material.

The high sand content limits recreation use and landscaping, and settling is a limitation, especially for permanent structures. Some intensively used areas require a veneer of loamy soil to improve trafficability and to improve water holding capacity for better support of plants. Topsoil, fertilizers, and irrigation are usually needed to overcome droughtiness and low fertility when establishing lawns and shrubs, and most species must be salt tolerant.

This unit is poorly suited to all types of wildlife habitat.

Uf—Udorthents, refuse substratum. This unit consists of nearly level to steep, sandy soils in sanitary landfills that have been reworked by earth-moving and grading equipment to cover trash and other refuse. Often the refuse is partly covered or mixed with the sandy fill material. The sides of most areas are steep, and the tops are nearly level or gently sloping. The areas are mostly rectangular or irregular in shape and range from 15 to 100 acres. Slope ranges from 0 to 35 percent, and the slopes are smooth or convex.

Commonly, the upper 2 to 3 feet of this unit is mixed layers of sandy fill material. This material overlies layers of garbage and refuse which range in thickness mainly from 2 to 10 feet. Where the sandy material is used just for daily cover, it is likely to be thinner than 2 feet.

Some areas of this map unit are in former sand and gravel pits, and others have been filled with the original soil material.

Properties—

Permeability: Variable but generally ranges from very rapid to moderate.
Water table: Variable, depending upon elevation of the unit and the level of the water in adjacent soils.
Available water capacity: Mainly very low.
Erosion hazard: Moderate on sloping areas; severe on steep areas.

Most active sanitary landfills do not have a plant cover. Older or abandoned landfills have varying amounts of grasses, weeds, and shrubs.

Settling of the underlying material and the instability of the material are major limitations of this unit for most types of development, including housing, local roads and streets, and septic effluent disposal systems. Droughtiness and low natural fertility limit the unit for landscaping and make the use of topsoil, fertilizers, and irrigation necessary.

Onsite investigation is necessary to determine the potentials and limitations of this unit for any use.

Ug—Urban land. This map unit consists of areas where at least 85 percent of the surface is covered with asphalt, concrete, or other impervious building material. These areas mostly are parking lots, shopping centers, industrial parks, or institutional sites. Many are in the business centers in the villages and cities. Most areas are nearly level, and some are gently sloping. A few small areas, mostly in the northern part of the county, are strongly sloping. Many areas are rectangular or long and narrow and are mainly adjacent to local main thoroughfares. The areas range from about 3 acres to as much as several hundred acres.

Included with this unit in mapping are small areas of soil that has not been appreciably altered or that is not under an impervious cover. These areas are mainly in lawns or other landscaped areas. Most of the included open areas are well drained Riverhead, Hempstead, or Enfield soils or excessively drained Udipsamments.

In many areas rapid or very rapid runoff prevents adequate discharge of runoff from intense rainstorms to safe outlets. A few areas are in low spots where seasonal wetness sometimes causes temporary flooding of the surface or frost heaving and subsequent breakup of surface pavements.

Uh—Urban land-Hempstead complex. This unit consists of urbanized areas and very deep, well drained soils. It is on nearly level plains. The areas of this unit are variable in shape and are as small as 10 acres, but some areas are as much as 1,000 acres. Slope ranges from 0 to 3 percent, but in most areas that are not near drainageways or depressions it is less than 2 percent. This unit consists of about 75 percent urbanized areas, 20 percent Hempstead soils, and 5 percent other soils. The urbanized areas and Hempstead soils are so intermingled that it was not practical to map them separately.

The urbanized areas consist of buildings, roads, driveways, parking lots, and other manmade structures.

The typical sequence, depth, and composition of the layers of Hempstead soils are as follows—

Surface layer:
Surface to 11 inches, black silt loam

Subsurface layer:
11 to 15 inches, dark brown silt loam

Subsoil:
15 to 29 inches, yellowish brown silt loam

29 to 33 inches, strong brown very gravelly loamy sand

Substratum:
33 to 60 inches or more, very pale brown sand and gravel

Included with this unit in mapping are small areas of well drained Enfield soils and moderately well drained Mineola soils. The Enfield soils are in areas in which the surface layer is lighter colored than in the Hempstead soils. Mineola soils are in low spots where the underlying sand and gravel is just beneath the soil surface. Some Hempstead soils along drainageways have slopes of slightly more than 3 percent.

Properties of the Hempstead soils—

Permeability: Moderate in the surface layer, subsurface layer, and upper part of the subsoil; rapid in the lower part of the subsoil; and very rapid in the substratum.
Available water capacity: High.
Soil reaction: Moderately acid to very strongly acid in the surface layer, subsurface layer, and subsoil; strongly acid or very strongly acid in the substratum.
Surface runoff: Slow.
Erosion hazard: Slight.
Water table: At a depth of more than 6 feet.
Root zone: To a depth of 40 inches or more.

The areas on which there are no structures are lawns, gardens, small playgrounds, border strips along streets and sidewalks, and a few vacant lots.

The Hempstead soils have few limitations as a site for dwellings with or without basements, but frost action is a hazard to sidewalks and driveways. Replacing the surface layer and subsoil with coarse-grained material will help to overcome the frost action.

The Hempstead soils have few limitations as a site for septic effluent disposal if enough open area is available. Pollution of the ground water is a hazard, however, because the substratum is a poor filter for effluent.

Though the Hempstead soils have few limitations as a site for roads and streets or recreation areas, the lack of open space in the unit generally prevents development of such facilities.

The soils have few limitations for landscaping. The surface layer of the soils generally has a good natural supply of plant nutrients and ample available water capacity.

Because of the urban environment, most areas are not suitable as habitat for wildlife other than songbirds.

Um—Urban land-Mineola complex. This unit consists of urbanized areas and very deep, moderately well drained soils. It is in low, nearly level areas along intermittent or shallow drainageways. The areas are mostly long and narrow and range from 10 to 100 acres. Slopes are plane or concave and range from 0 to 3 percent. This unit consists of about 75 percent urbanized areas, 20 percent Mineola soils, and 5 percent other soils. The urbanized areas and Mineola soils are so intermingled that it was not practical to map them separately.

The urbanized areas consist of buildings, roads, driveways, parking lots, and other manmade structures.

The typical sequence, depth, and composition of the layers of Mineola soils are as follows—

Surface layer:
Surface to 3 inches, black sandy loam

Subsurface layer:
3 to 9 inches, dark reddish brown sandy loam
9 to 11 inches, dark brown sandy loam

Subsoil:
11 to 18 inches, brown very gravelly loamy sand

Substratum:
18 to 21 inches, brownish yellow sand
21 to 42 inches, faintly mottled, yellowish brown very gravelly sand
42 to 60 inches or more, very pale brown sand

Included with his unit in mapping are small areas of Udipsamments and well drained Hempstead soils. The Udipsamments are in areas where sandy material has been spread on the surface or worked into the original surface layer. The Hempstead soils are on convex areas at the edges of the unit.

Properties of the Mineola soils—

Permeability: Moderately rapid in the surface layer, subsurface layer, and subsoil; very rapid in the substratum.
Available water capacity: Low.
Soil reaction: Moderately acid to very strongly acid throughout.
Surface runoff: Slow.
Erosion hazard: Slight.
Water table: At a depth of 2 to 4 feet during seasonally wet periods.
Root zone: To a depth of 40 inches or more.

The areas on which there are no structures are lawns, gardens, small playgrounds, border strips along streets, a few vacant lots, and right-of-ways along drainage channels and ground-water recharge areas.

Seasonal wetness limits the Mineola soils as a site for dwellings, especially those with basements. Using foundation drains, sealing basement walls, and using fill material to elevate the site help to overcome the wetness. Frost action is a hazard to sidewalks and driveways, and drainage is needed in some areas to overcome the frost action.

Seasonal wetness is a major limitation of the Mineola soils as a site for septic effluent disposal, and the permeability in the substratum causes a hazard of pollution of the ground water from septic effluent.

Seasonal wetness, frost action, and small stones in the soil are limitations of the Mineola soils as a site for local roads and streets or for recreation. The main limitation, however, is the lack of open space in this unit.

These soils have few limitations for landscaping, but many of the included Udipsamments are droughty or contain a high content of gravel in the surface layer or gravel on the surface.

This map unit is generally not suitable as habitat for wildlife other than songbirds.

UnB—Urban land-Montauk complex, 3 to 8 percent slopes. This unit consists of urbanized areas and very deep, well drained soils. This unit is on the gently sloping tops and sides of low hills and broad ridges. The areas of this unit are round, oval, or irregular in shape and range mainly from 10 to 100 acres. A few areas are as large as several hundred acres. This unit consists of about 60 percent urbanized areas, 25 percent Montauk soils, and 15 percent other soils. The urbanized areas and Montauk soils are so intermingled that it was not practical to map them separately.

The urbanized areas are buildings, roads, driveways, parking lots, and other manmade structures.

The typical sequence, depth, and composition of the layers of Montauk soils are as follows—

Surface layer:

Surface to 7 inches, dark grayish brown fine sandy loam

Subsoil:

7 to 19 inches, strong brown fine sandy loam
19 to 28 inches, yellowish brown fine sandy loam
28 to 34 inches, light yellowish brown sandy loam

Substratum:

34 to 47 inches, firm, pale brown loamy sand
47 to 60 inches or more, firm, light yellowish brown gravelly loamy sand

Included with this unit in mapping are small areas of well drained Enfield and Riverhead soils. The Enfield soils are in areas where the subsoil has a high silt content, and the Riverhead soils are where the subsoil is mostly sandy loam. The substratum in both soils is friable, and both soils make up about 10 percent of this map unit. Also included are mostly wetter soils, such as moderately well drained Scio soils and somewhat poorly drained and poorly drained Walpole soils along shallow drainageways and in depressions. These soils make up about 5 percent of the unit.

Properties of the Montauk soils—

Permeability: Moderately rapid or moderate in the surface layer and subsoil; slow or moderately slow in the substratum.
Available water capacity: Moderate.
Soil reaction: Extremely acid to moderately acid throughout.
Erosion hazard: Slight.
Water table: Perched at a depth of 2 to 2.5 feet during seasonally wet periods.
Root zone: To a depth of about 30 inches.

The areas on which there are no structures are lawns, gardens, small playgrounds, border strips along streets and sidewalks, and a few vacant lots.

Seasonal wetness limits the Montauk soils as a site for dwellings with or without basements. Using foundation drains and sealing basement walls will control the wetness. Some excavations can be difficult because some substratum layers are very firm and contain boulders.

The permeability in the substratum is a major limitation of the Montauk soils as a site for septic effluent disposal, and special design of the effluent disposal system is necessary in some areas. Onsite investigation is needed to determine if any layers are permeable enough for effluent disposal and to determine if the lot size is large enough to accommodate an effluent disposal system.

Seasonal wetness, slow permeability, and frost action limit the soils as a site for local roads and streets or for recreation. The main limitation, however, is the lack of open space.

The soils have few limitations for landscaping, but stones must be removed from some areas.

Because of the urban environment, this unit generally is unsuitable as habitat for wildlife other than songbirds.

UnC—Urban land-Montauk complex, 8 to 15 percent slopes. This unit consists of urbanized areas and very deep, well drained Montauk soils. It is on the sides of strongly sloping small hills and ridges. The areas of this unit are long and narrow or irregular in shape and range mainly from about 5 to 80 acres. A few areas are slightly larger. This unit consists of about 60 percent urbanized areas, 25 percent Montauk soils, and 15 percent other soils. The urbanized areas and Montauk soils are so intermingled that it was not practical to map them separately.

The urbanized areas are buildings, roads, driveways, parking lots, and other manmade structures.

The typical sequence, depth, and composition of the layers of the Montauk soils are as follows—

Surface layer:

Surface to 7 inches, dark grayish brown fine sandy loam

Subsoil:

7 to 19 inches, strong brown fine sandy loam
19 to 28 inches, yellowish brown fine sandy loam
28 to 34 inches, light yellowish brown sandy loam

Substratum:
34 to 47 inches, firm, pale brown loamy sand
47 to 60 inches, firm, light yellowish brown gravelly loamy sand

Included with this unit in mapping are small areas of well drained Riverhead soils and excessively drained Udipsamments. The Riverhead soils are in areas where the substratum is friable, and they make up about 10 percent of the unit. The Udipsamments are in areas where the sandy substratum has been mixed into the upper layers of the original soil. Some have cobblestones on the surface. The Udipsamments make up as much as 5 percent of the unit. Some shallow drainageways contain small areas of moderately well drained Sudbury soils or poorly drained Walpole soils.

Properties of the Montauk soils—

Permeability: Moderate or moderately rapid in the surface layer and subsoil; slow or moderately slow in the substratum.
Available water capacity: Moderate.
Soil reaction: Extremely acid to moderately acid throughout.
Surface runoff: Medium.
Erosion hazard: Moderate.
Water table: Perched at a depth of 2 to 2.5 feet during seasonally wet periods.
Root zone: To a depth of about 30 inches.

The areas on which there are no structures are lawns, gardens, small playgrounds, border strips along streets and sidewalks, and a few vacant lots.

Seasonal wetness and slope limit the soil as a site for dwellings with or without basements. The substratum restricts the downward movement of water. Using foundation drains and interceptor drains will help reduce wetness or dampness in basements. Grading will overcome the slope, but designing the structure to fit the landscape will reduce the amount of grading needed. Erosion is a hazard on areas where the plant cover is removed during grading. Using a cover of mulch on these areas will help to reduce erosion.

The seasonal wetness and the permeability in the substratum are major limitations of this soil as a site for septic effluent disposal. Using a special design or enlarging the filter field often is necessary to overcome those limitations, and onsite investigation commonly is needed to determine if more permeable layers are below the substratum. The areas of included Riverhead soils are more permeable than this Montauk soil. The slope of the soil makes design alterations necessary, and the soil must be protected against erosion.

Seasonal wetness, slope, the permeability in the substratum, and frost action limit the soil as a site for local roads and streets or for recreation. The main limitation, however, is the lack of open space in this unit.

Slope limits the soil for landscaping. In some areas gravel and stones in the surface layer limit landscaping.

Because of the urban environment, most areas of this unit are unsuitable as habitat for wildlife other than songbirds.

UpA—Urban land-Plymouth complex, 0 to 3 percent slopes. This unit consists of urbanized areas and very deep, excessively drained Plymouth soils. It is on the tops of low, nearly level benches and ridges. The areas are rectangular to irregular in shape and range from about 10 to 50 acres. They consist of about 65 percent urbanized areas, 20 percent Plymouth soils, and 15 percent other soils. The Urban land and Plymouth soils are so intermingled that it was not practical to map them separately.

The urbanized areas are buildings, roads, driveways, parking lots, and other manmade structures.

The typical sequence, depth, and composition of the layers of Plymouth soils are as follows—

Surface layer:
Surface to 5 inches, dark brown loamy sand

Subsoil:
5 to 13 inches, strong brown loamy sand
13 to 26 inches, yellowish brown loamy sand

Substratum:
26 to 42 inches, brownish yellow gravelly sand
42 to 60 inches or more, pale yellow gravelly coarse sand

Included with this unit in mapping are small areas of well drained Riverhead soils and moderately well drained Sudbury soils. The Riverhead soils are on slight rises, and the Sudbury soils are in shallow depressions. Each of these soils makes up about 5 percent of the unit. Another 5 percent is areas where the upper layers of the soil have been graded and replaced by coarse sand and gravel.

Properties of the Plymouth soils—

Permeability: Rapid in the surface layer and subsoil; very rapid in the substratum.
Available water capacity: Very low.
Soil reaction: Very strongly acid or strongly acid throughout.
Surface runoff: Slow.
Erosion hazard: Slight.
Water table: At a depth of more than 6 feet.
Root zone: To a depth of 40 inches or more.

The areas on which there are no structures are lawns, gardens, small playgrounds, border strips along streets and sidewalks, and a few vacant lots.

This unit has few limitations as a site for dwellings with or without basements. The included areas of Sudbury soils are limited as sites for dwellings with basements because of seasonal wetness.

This unit has few limitations as a site for septic effluent disposal. Pollution of the ground water is a hazard caused by the very rapid permeability and poor filtering capacity of the substratum.

Generally, a lack of open areas in this unit prevents development of roads and streets or recreation areas.

Droughtiness and low natural fertility limit landscaping in this unit. Topsoil, plant nutrients, and irrigation are needed to establish and maintain lawns and shrubs in some areas.

Because of the urban nature of this unit, most areas are unsuitable as habitat for wildlife other than songbirds.

UpB—Urban land-Plymouth complex, 3 to 8 percent slopes. This unit consists of urbanized areas and very deep, excessively drained soils. It is on the tops of gently sloping, undulating benches and sides of small hills and knolls. The areas are long and narrow to irregular in shape and range from about 10 to 60 acres. They consist of about 65 percent urbanized areas, 20 percent Plymouth soils, and 15 percent other soils. The urbanized areas and Plymouth soils are so intermingled that it was not practical to map them separately.

The urbanized areas are buildings, roads, driveways, parking lots, and other manmade structures.

The typical sequence, depth, and composition of the layers of Plymouth soils are as follows—

Surface layer:
Surface to 5 inches, dark brown loamy sand

Subsoil:
5 to 13 inches, strong brown loamy sand
13 to 26 inches, yellowish brown loamy sand

Substratum:
26 to 42 inches, brownish yellow gravelly sand
42 to 60 inches or more, pale yellow gravelly coarse sand

Included with this unit in mapping are small areas of well drained Riverhead soils and moderately well drained Sudbury soils. The Riverhead soils are on the higher parts of this unit, and the Sudbury soils are in small depressions.

Properties of the Plymouth soils—

Permeability: Rapid in the surface layer and subsoil; very rapid in the substratum.
Available water capacity: Very low.
Soil reaction: Very strongly acid or strongly acid throughout.
Surface runoff: Slow.
Erosion hazard: Slight.
Water table: At a depth of more than 6 feet.
Root zone: To a depth of 40 inches or more.

The areas on which there are no structures are lawns, gardens, small playgrounds, border strips along streets and sidewalks, and a few vacant lots.

This unit has few limitations as a site for dwellings with or without basements. The included areas of Sudbury soils are limited as sites for dwellings with basements because of seasonal wetness.

This unit has few limitations as a site for septic effluent disposal. Pollution of the ground water is a hazard caused by the very rapid permeability and poor filtering capacity of the substratum.

Generally, a lack of open areas in this unit prevents development of roads and streets or recreation areas.

Droughtiness and low natural fertility limit landscaping in this unit. Topsoil, plant nutrients, and irrigation are needed to establish and maintain lawns and shrubs in some areas.

Because of the urban nature of this unit, most areas are unsuitable as habitat for wildlife other than songbirds.

UpC—Urban land-Plymouth complex, 8 to 15 percent slopes. This unit consists of urbanized areas and very deep, excessively drained soils. It is on the sloping sides of benches and small hills or ridges. The areas are rectangular to irregular in shape. They range from 5 to 25 acres. The unit is about 60 percent urbanized areas, 25 percent Plymouth soils, and 15 percent other soils. The urbanized areas and Plymouth soils are so intermingled that it was not practical to map them separately.

The urbanized areas are buildings, roads, driveways, parking lots, and other manmade structures.

The typical sequence, depth, and composition of the layers of Plymouth soils are as follows—

Surface layer:
Surface to 5 inches, dark brown loamy sand

Subsoil:
5 to 13 inches, strong brown loamy sand
13 to 26 inches, yellowish brown loamy sand

Substratum:
26 to 42 inches, brownish yellow gravelly sand
42 to 60 inches or more, pale yellow gravelly coarse sand

Included with this unit in mapping are small areas of well drained Riverhead soils and Udipsamments. The

Riverhead soils are more loamy than these Plymouth soils, and the Udipsamments are in areas of construction activity where sandy material has been deposited on the surface.

Properties of the Plymouth soils—

Permeability: Rapid in the surface layer and subsoil; very rapid in the substratum.
Available water capacity: Very low.
Soil reaction: Very strongly acid or strongly acid throughout.
Surface runoff: Slow to medium.
Erosion hazard: Slight to moderate.
Water table: At a depth of more than 6 feet.
Root zone: To a depth of 40 inches or more.

The areas on which there are no structures are lawns, gardens, small playgrounds, border strips along streets and sidewalks, and a few vacant lots.

Slope is the main limitation of the soil as a site for dwellings with or without basements. Erosion is a hazard if the plant cover is removed. Establishing a plant cover on exposed areas as soon as construction is completed will reduce the erosion hazard.

Slope and the permeability limit the soil as a site for septic effluent disposal. The permeability causes a hazard of pollution to the ground water.

Generally, a lack of open areas in this unit prevents development of roads and streets or recreation areas.

Droughtiness and low natural fertility limit landscaping in this unit. Topsoil, plant nutrients, and irrigation are needed to establish and maintain lawns and shrubs in some areas.

Because of the urban nature of this unit, most areas are unsuitable as habitat for wildlife other than songbirds.

UpD—Urban land-Plymouth complex, 15 to 25 percent slopes. This unit consists of urbanized areas and very deep, excessively drained Plymouth soils. It is on moderately steep side slopes of benches and ridges. The areas of this unit are long and narrow and range from 4 to 20 acres. The unit is about 55 percent urbanized areas, 25 percent Plymouth soils, and 20 percent other soils. The urbanized areas and Plymouth soils are so intermingled that it was not practical to map them separately.

The urbanized areas are buildings, roads, driveways, parking lots, and other manmade structures.

The typical sequence, depth, and composition of the layers of Plymouth soils are as follows—

Surface layer:
Surface to 5 inches, dark brown loamy sand

Subsoil:
5 to 13 inches, strong brown loamy sand
13 to 26 inches, yellowish brown loamy sand

Substratum:
26 to 42 inches, brownish yellow gravelly sand
42 to 60 inches or more, pale yellow gravelly coarse sand

Included with this unit in mapping are small areas of Riverhead and Montauk soils and Udipsamments. The Riverhead and Montauk soils are more loamy than these Plymouth soils, and the Montauk soils have a dense substratum. The Udipsamments are in areas of construction activity where sandy material has been deposited on the original surface.

Properties of the Plymouth soils—

Permeability: Rapid in the surface layer and subsoil; very rapid in the substratum.
Available water capacity: Very low.
Soil reaction: Very strongly acid or strongly acid throughout.
Surface runoff: Medium.
Erosion hazard: Moderate to severe.
Water table: At a depth of more than 6 feet.
Root zone: To a depth of 40 inches or more.

The areas on which there are no structures are lawns, gardens, small playgrounds, border strips along streets and sidewalks, and a few vacant lots.

Slope is a major limitation of the soil as a site for dwellings with or without basements, and erosion is a hazard in areas with no plant cover. Maintaining the original plant cover or establishing a plant cover during construction or soon after construction is completed will reduce erosion.

Slope and the poor filtering capacity of the substratum are the main limitations of the soils as a site for septic effluent disposal. The poor filtration causes a hazard of pollution of the ground water.

Generally, a lack of open areas in this unit prevents development of roads and streets or recreation areas.

Slope, droughtiness, and low fertility limit landscaping on this unit. Loamy topsoil, fertilizers, and irrigation are needed in some areas to overcome those limitations. Using mulch or establishing a plant cover is necessary to control erosion on unprotected areas.

Because of the urban nature of this unit, most areas are unsuitable as habitat for wildlife other than songbirds.

UrA—Urban land-Riverhead complex, 0 to 3 percent slopes. This unit consists of urbanized areas and very deep, well drained soils. It is on the nearly level tops of benches, plains, and broad ridges. The areas are round or irregularly shaped and range from 10 to 1,000 acres. This unit consists of about 65 percent urbanized areas, 20 percent Riverhead soils, and 15 percent other soils. The urbanized areas and Riverhead soils are so

intermingled that it was not practical to map them separately.

The urbanized areas are buildings, roads, driveways, parking lots, and other manmade structures.

The typical sequence, depth, and composition of the layers of the Riverhead soils are as follows—

Surface layer:
Surface to 3 inches, dark brown sandy loam

Subsoil:
3 to 8 inches, strong brown fine sandy loam
8 to 17 inches, yellowish brown fine sandy loam
17 to 24 inches, yellowish brown sandy loam
24 to 35 inches, brownish yellow loamy sand

Substratum:
35 to 52 inches, brownish yellow sand
52 to 60 inches or more, brownish yellow gravelly sand

Included with this unit in mapping are small areas of well drained Enfield soils, excessively drained Plymouth soils, and excessively drained to moderately well drained Udipsamments. The Enfield soils are in areas where the subsoil has a higher silt content than that in the Riverhead soils, and they make up about 10 percent of the unit. The Plymouth soils are in areas where the subsoil is sandy, and the Udipsamments are where sandy material has been mixed with the surface layer and subsoil. Together, those two soils make up about 5 percent of the unit.

Properties of the Riverhead soils—

Permeability: Moderately rapid in the surface layer and subsoil; very rapid in the substratum.
Available water capacity: Moderate.
Soil reaction: Very strongly acid or strongly acid throughout.
Surface runoff: Slow.
Erosion hazard: Slight.
Water table: At a depth of more than 6 feet.
Root zone: To a depth of 40 inches or more.

The areas on which there are no structures are lawns, gardens, small playgrounds, border strips along streets and sidewalks, and a few vacant lots.

The soil has few limitations as a site for dwellings with or without basement and for septic effluent disposal. In areas used for septic systems, however, pollution is a hazard to the ground water because the substratum is a poor filter of effluent.

Generally, a lack of open areas in this unit prevents development of roads and streets or recreation areas.

The soil has few limitations for landscaping. The included areas of Plymouth soils and Udipsamments are droughty and low in natural fertility. In these areas irrigation and fertilizers will be needed for successful establishment of lawns and shrubs.

Because of the urban nature of this unit, most areas are unsuitable as habitat for wildlife other than songbirds.

UrB—Urban land-Riverhead complex, 3 to 8 percent slopes. This unit consists of urbanized areas and very deep, well drained Riverhead soils. It is gently sloping on the tops of low hills and ridges and along side slopes of drainageways. Some areas are undulating. The areas are oval, long and narrow, or irregular in shape. They range mainly from 5 to 100 acres. This unit consists of about 60 percent urbanized areas, 25 percent Riverhead soils, and 15 percent other soils. The urbanized areas and Riverhead soils are so intermingled that it was not practical to map them separately.

The urbanized areas are buildings, roads, driveways, parking lots, and other manmade structures.

The typical sequence, depth, and composition of the layers of Riverhead soils are as follows—

Surface layer:
Surface to 3 inches, brown sandy loam

Subsoil:
3 to 8 inches, strong brown fine sandy loam
8 to 17 inches, yellowish brown fine sandy loam
17 to 24 inches, yellowish brown sandy loam
24 to 35 inches, brownish yellow loamy sand

Substratum:
35 to 52 inches, brownish yellow sand
52 to 60 inches or more, brownish yellow gravelly sand

Included with this unit in mapping are small areas of well drained Enfield and Montauk soils, excessively drained Plymouth soils, and excessively drained to moderately well drained Udipsamments. The Enfield soils are in areas where the subsoil has a higher silt content than that in the Riverhead soils, and they make up 5 percent of the unit. The Montauk soils have a firm substratum. They make up 5 percent of the unit. The Plymouth soils are in areas where the subsoil is sandy, and the Udipsamments are in areas where sandy material has been mixed into the surface layer and subsoil. Together, they make up about 5 percent of the unit.

Properties of the Riverhead soils—

Permeability: Moderately rapid in the surface layer and subsoil; very rapid in the substratum.
Available water capacity: Moderate.
Soil reaction: Very strongly acid or strongly acid throughout.
Surface runoff: Slow.

Erosion hazard: Slight.
Water table: At a depth of more than 6 feet.
Root zone: To a depth of 40 inches or more.

The areas on which there are no structures are lawns, gardens, small playgrounds, border strips along streets and sidewalks, and a few vacant lots.

The soil has few limitations as a site for dwellings with or without basement and for septic effluent disposal. In areas used for septic systems, however, pollution is a hazard to the ground water because the substratum is a poor filter of effluent.

Generally, a lack of open areas in this unit prevents development of roads and streets or recreation areas.

The soil has few limitations for landscaping. The included areas of Plymouth soils and Udipsamments are droughty and low in natural fertility. In these areas irrigation and fertilizers will be needed for successful establishment of lawns and shrubs.

Because of the urban nature of this unit, most areas are unsuitable as habitat for wildlife other than songbirds.

UrC—Urban land-Riverhead complex, 8 to 15 percent slopes. This unit consists of urbanized areas and very deep, well drained Riverhead soils. It is on strongly sloping sides of hills and ridges. The areas are long and narrow or irregular in shape and range mainly from 5 to 60 acres. They consist of about 65 percent urbanized areas, 20 percent Riverhead soils, and 15 percent other soils. The urbanized areas and Riverhead soils are so intermingled that it was not practical to map them separately.

The urbanized areas are buildings, roads, driveways, parking lots, and other manmade structures.

The typical sequence, depth, and compostion of the layers of Riverhead soils are as follows—

Surface layer:
Surface to 3 inches, brown sandy loam

Subsoil:
3 to 8 inches, strong brown fine sandy loam
8 to 17 inches, yellowish brown fine sandy loam
17 to 24 inches, yellowish brown sandy loam
24 to 35 inches, brownish yellow loamy sand

Substratum:
35 to 52 inches, brownish yellow sand
52 to 60 inches or more, brownish yellow gravelly sand

Included with this unit in mapping are small areas of well drained Montauk soils, excessively drained Plymouth soils, and excessively drained to moderately well drained Udipsamments. The Montauk soils are in areas where the substratum is firm, and they make up 5 percent of the unit. The Plymouth soils are in spots where the subsoil is more sandy than that in the Riverhead soils, and the Udipsamments are in areas where sandy material has been mixed with the surface layer and subsoil during construction activities. Each of those soils makes up about 5 percent of the unit.

Properties of the Riverhead soils—

Permeability: Moderately rapid in the surface layer and subsoil; very rapid in the substratum.
Available water capacity: Moderate.
Soil reaction: Very strongly acid or strongly acid throughout.
Surface runoff: Medium.
Erosion hazard: Slight to moderate.
Water table: At a depth of more than 6 feet.
Root zone: To a depth of 40 inches or more.

The areas on which there are no structures are lawns, gardens, small playgrounds, border strips along streets and sidewalks, and a few vacant lots.

Slope is the main limitation of the soil as a site for dwellings with or without basements. Land shaping and grading will help to overcome the slope. Erosion is a hazard in areas cleared for construction, however, so designing dwellings to conform to the natural setting will help keep land shaping to a minimum and thus reduce erosion. Establishing a plant cover as soon as construction is completed will also reduce erosion.

Slope and the permeability of the substratum limit the soil as a site for septic effluent disposal. Establishing a plant cover on the areas where the plant cover has been removed during installation of effluent disposal systems will reduce or control erosion. Pollution is a hazard to the ground water because of the poor filtering capacity of the substratum.

Slope is a limitation of the soil as a site for local roads and streets or for recreation, but the major limitation of the unit is a lack of open space.

Slope and erosion limit this soil for landscaping. Mulching is necessary in some exposed areas to reduce or control erosion. Irrigation is necessary in some dry years to help ensure survival of new lawns and shrubs.

Because of the urban nature of this unit, most areas are unsuitable as habitat for wildlife other than songbirds.

Us—Urban land-Sudbury complex. This unit consists of urbanized areas and very deep, moderately well drained soils. It is on nearly level plains. The areas of this soil are variable in shape and are as much as several hundred acres each. Slope ranges from 0 to 3 percent. This unit consists of about 70 percent urbanized areas, 20 percent moderately well drained Sudbury soils, and 10 percent other soils. The urbanized areas and Sudbury soils are so intermingled that it was not practical to map them separately.

The urbanized areas are buildings, roads, driveways, parking lots, and other manmade structures.

The typical sequence, depth, and composition of the layers of Sudbury soils are as follows—

Surface layer:
Surface to 5 inches, dark reddish brown fine sandy loam

Subsoil:
5 to 18 inches, yellowish brown sandy loam
18 to 28 inches, mottled, yellowish brown gravelly loamy sand

Substratum:
28 to 40 inches, mottled, pale brown very gravelly sand
40 to 60 inches, very pale brown very gravelly sand

Included with this soil in mapping are small areas of excessively drained to moderately well drained Udipsamments and well drained Riverhead soils. The Udipsamments are in areas of construction activity where sandy material has been mixed with the surface layer and subsoil. The Riverhead soils are on slight rises or knolls throughout the unit. Each of the included soils makes up about 5 percent of the unit.

Properties of the Sudbury soils—

Permeability: Moderately rapid in the surface layer and upper part of the subsoil; moderately rapid or rapid in the lower part of the subsoil; and rapid in the substratum.
Available water capacity: Low.
Soil reaction: Extremely acid to moderately acid throughout.
Surface runoff: Slow.
Erosion hazard: Slight.
Water table: At a depth of 1.5 to 3 feet during seasonally wet periods.
Root zone: To a depth of 30 inches or more.

The areas on which there are no structures are lawns, gardens, small playgrounds, border strips along streets and sidewalks, and a few vacant lots.

Seasonal wetness limits the soil as a site for dwellings, especially those with basements. Using foundation drains and sealing foundation walls will help overcome the wetness.

Seasonal wetness and poor filtering capacity are major limitations of the soil as a site for septic effluent disposal. During some wet periods, the water table rises into the lower part of the subsoil. Mounding or other special design of effluent disposal fields is sometimes required to overcome this limitation. The poor filtering capacity causes a hazard of pollution to the ground-water table if filter fields are not specially designed.

Seasonal wetness limits the soil as a site for roads and streets or recreation facilities, but the main limitation of the unit is a lack of open space.

For landscaping, the Sudbury soil has few limitations. Included areas of Udipsamments are likely to be droughty and sometimes require irrigation for establishment of shrubs and lawns. Low natural fertilty in the Sudbury soils makes the addition of plant nutrients necessary for optimum growth of shrubs and trees.

Because of the urban nature of this unit, most areas are unsuitable as habitat for wildlife other than songbirds.

Uu—Urban land-Udipsamments complex. This unit consists of urbanized areas and of excessively drained, very deep soils that have been mixed with other soils or where the original soil has been removed. The areas of the unit are mostly rectangular, are nearly level, and range mainly from 10 to 100 acres. Slopes range mainly from 0 to 3 percent. This unit consists of about 70 percent urbanized areas, 25 percent Udipsamments, and 5 percent other soils. The urbanized areas and Udipsamments are so intermingled that it was not practical to map them separately.

The urbanized areas are houses, commercial buildings, roads, parking lots, and other manmade structures.

Commonly, the Udipsamments have a surface layer of dark yellowish brown loamy sand about 3 inches thick. The substratum extends to a depth of 60 inches or more. It is layers of strong brown or brownish yellow sand or gravelly sand. The differences in these layers are often the result of grading.

Included with this unit in mapping are spots of well drained Riverhead soils and moderately well drained Sudbury soils. The Riverhead soils are throughout the unit, and the Sudbury soils are mostly in low areas and depressions.

Properties of the Udipsamments—

Permeability: Mainly rapid or very rapid.
Water table: At a depth of more than 6 feet.
Available water capacity: Very low.
Runoff: Very slow.

The areas on which there are no structures are lawns, gardens, small playgrounds, border strips along streets and sidewalks, and a few vacant lots.

The areas of Udipsamments that are large enough generally have few limitations as sites for dwellings with or without basements, but onsite investigation is necessary to determine the suitability.

Onsite investigation of the soil is necessary to determine the suitabilty for sewage effluent disposal. A lack of open space is a limitation, and pollution of the ground water is a hazard because the sandy material is a poor filter of effluent.

Because there are few open areas in this unit, the development of roads and recreation facilities is usually not feasible. In the few open areas the high sand content in the Udipsamments limits trafficability.

Droughtiness and low natural fertility limit landscaping on this unit. In most areas new shrubs and grasses require topsoil, fertilizer, mulch, and irrigation.

Because of the urban nature of this unit, most areas are unsuitable as habitat for wildlife other than songbirds.

Uw—Urban land-Udipsamments, wet substratum complex. This unit consists of urbanized areas and excessively drained to moderately well drained, very deep Udipsamments. This unit is in nearly level tidal areas, mostly adjacent to the Atlantic Ocean, that have been filled with sandy material dredged mainly from adjacent waterways and channels. The fill is 4 to 10 feet thick over organic tidal marsh sediments. Most areas of the unit are rectangular or crescent shaped and range from 10 to 100 acres. The slope ranges from 0 to 2 percent. This unit consists of about 70 percent urbanized areas; 25 percent Udipsamments, wet substratum; and 5 percent other soils. The urbanized areas and Udipsamments are so intermingled that it was not practical to map them separately.

The urbanized areas are houses, commercial buildings, roads, parking lots, and other manmade structures.

Commonly, the Udipsamments have a grayish brown, loamy surface layer about 4 inches thick. The substratum is light gray sand or loamy sand and extends to a depth of about 65 inches. It is mottled in the lower part. Below a depth of 65 inches is black partially decomposed mucky peat.

Included with this unit in mapping are spots of well drained Riverhead soils and moderately well drained Sudbury soils.

Properties of the Udipsamments—

Permeability: Rapid or very rapid in sandy layers; moderate in the organic layers.
Water table: Usually at a depth of 4 feet or more but influenced by tidal action.
Available water capacity: Very low.
Runoff: Very slow.

The Udipsamments are in lawns, gardens, courtyards, and other open border strips. In many areas waterways have been cut into the unit to provide docking facilities for adjacent homesites. Most areas are used for housing, and few open areas are available.

Settling and compaction of the organic layers limit the unit as a site for dwellings without basements, and the water table is a limitation for dwellings with basements. Some areas of these soils are limited by tidal flooding during intense coastal storms. The use of pilings helps to overcome or alleviate the settling and wetness.

The water table in the substratum limits this unit as a site for septic effluent disposal. Pollution from effluent is a hazard to the ground water or to waters in adjacent tidal areas because the sandy material is a poor filter.

Wetness in the substratum and a high sand content are limitations of the Udipsamments as a site for recreation or roads and streets, but the main limitation for those uses is a lack of open space.

Droughtiness and low natural fertility are the main limitations of the Udipsamments for landscaping. Topsoil, nutrients, and irrigation are needed, and plants must be salt tolerant.

This unit is generally unsuitable as habitat for wildlife other than the waterfowl in the nearby channels and waterways.

Wa—Wallington silt loam. This soil is very deep, nearly level, and somewhat poorly drained. It is in low areas in broad depressions. The areas are round or irregular in shape and range from 2 to 25 acres.

The typical sequence, depth, and composition of the layers in this soil are as follows—

Surface layer:
Surface to 13 inches, very dark grayish brown silt loam

Subsurface layer:
13 to 18 inches, mottled, pale brown silt loam
18 to 24 inches, mottled, light brownish gray silt loam

Subsoil:
24 to 35 inches, firm and brittle, mottled, pale brown silt loam
35 to 42 inches, firm and brittle, mottled, light yellowish brown very fine sandy loam

Substratum:
42 to 60 inches or more, mottled, light yellowish brown stratified silt loam and very fine sand

Included with this soil in mapping are small areas of moderately well drained Scio soils and somewhat poorly drained and poorly drained Walpole soils. The Scio soils are on small convex areas, and the Walpole soils are in areas that contain less silt than this Wallington soil. Also included are small areas where the subsoil is less dense and brittle than that in this Wallington soil. Included soils make up about 25 percent of the unit.

Soil properties—

Permeability: Moderate in the surface and subsurface layers; slow in the subsoil and substratum.
Available water capacity: Moderate.
Soil reaction: Very strongly acid or strongly acid in the surface layer, subsurface layer, and subsoil; moderately acid to slightly acid in the substratum.

Surface runoff: Slow.
Erosion hazard: Slight.
Water table: Perched at a depth of 6 inches to 1.5 feet during seasonally wet periods.
Root zone: To a depth of about 20 inches.

Most areas of this soil are in woodland or a brushy cover. Some are in mixed grass and weeds.

Seasonal wetness limits this soil as a site for dwellings, and frost action is a hazard. Drainage will help reduce the hazard of frost heaving. Installing foundation drains and sealing foundation and basement walls will help to prevent wet basements.

Seasonal wetness and slow permeability limit the soil as a site for septic effluent disposal, especially in areas where the subsoil and substratum are thick. Draining such areas is difficult. Using permeable fill material helps to overcome the wetness and permeability.

Frost action, seasonal wetness, and low strength limit the soil as a site for local roads and streets. Using coarse subgrade fill helps to prevent damage caused by low strength and frost action. Installing roadside drainage helps to overcome the wetness and frost action.

Seasonal wetness limits most types of recreation development and landscaping. Drainage is needed and land shaping helps to divert surface water from high-use areas. Some spots need fill to elevate the surface.

Shrubs and ornamentals are best suited to this soil. Areas with no plant cover are subject to erosion during heavy rains.

This soil is well suited for most types of openland and woodland wildlife habitat and fairly well suited to wetland wildlife habitat.

Wd—Walpole fine sandy loam. This soil is very deep, nearly level, and poorly drained and somewhat poorly drained. It is in low areas or depressions and along shallow drainageways. The areas are long and narrow or round and range from 5 to 50 acres. Slopes are concave and range from 0 to 2 percent.

Typically, this soil is covered by a thin layer of partially decomposed leaves. Under that layer, the typical sequence, depth, and composition of the layers of the soil are as follows—

Surface layer:
Surface to 8 inches, very dark grayish brown sandy loam

Subsoil:
8 to 18 inches, mottled, brown sandy loam

Substratum:
18 to 36 inches, mottled, light brownish gray loamy sand
36 to 60 inches or more, mottled, light brownish gray very gravelly loamy sand

Included with this soil in mapping are small areas of moderately well drained Sudbury soils, somewhat poorly drained Wallington soils, and very poorly drained Berryland soils. The Sudbury soils are on small convex areas and make up 10 percent of the unit. The Wallington soils are in small areas with a subsoil mainly of silt loam, and the Berryland soils are in swales or the lowest spots in this unit. Those two soils make up as much as 10 percent of some areas.

Soil properties—

Permeability: Moderately rapid in the surface layer and subsoil; rapid or very rapid in the substratum.
Available water capacity: Moderate.
Soil reaction: Very strongly acid to moderately acid throughout.
Surface runoff: Sow.
Erosion hazard: Slight.
Water table: Between the surface and a depth of 1 foot during the wet season.
Root zone: To a depth of 20 inches or more when the water table drops in late spring.

Most areas of this soil are in woodland. A few areas are in brush.

The water table is the major limitation of this soil as a site for dwellings with or without basements, for septic effluent disposal, for local roads and streets, or for landscaping. Drainage is necessary but is difficult to achieve because the water table is so close to the surface and there is a lack of suitable outlets. Pollution of the water table is a hazard in areas used for septic effluent disposal. Wetness-tolerant plants and shrubs are needed for landscaping.

The water table also is the major limitation for recreation development. Some low-intensity uses are suitable in the drier summer months. Intensive uses, such as playgrounds, will likely need fill material to adequately elevate and dry the site.

This soil has fair suitability for openland and woodland wildlife habitat and is well suited to wetland wildlife habitat.

Prime Farmland

Prime farmland is one of several kinds of important farmlands defined by the U.S. Department of Agriculture. Identification of prime farmland is a major step in meeting the Nation's needs for food and fiber.

The U.S. Department of Agriculture defines prime farmland as the land that is best suited to producing food, feed, forage, fiber, and oilseed crops. It has the soil quality, growing season, and moisture supply needed to produce a sustained high yield of crops while using acceptable farming methods. Prime farmland produces the highest yields and requires minimal amounts of energy and economic resources, and farming it results in the least damage to the environment.

An area identified as prime farmland must be used for producing food or fiber or must be available for those uses. Thus, urban and built-up land and water areas are not classified as prime farmland.

The general criteria for prime farmland are as follows: a generally adequate and dependable supply of moisture from precipitation or irrigation, favorable temperature and growing-season length, acceptable levels of acidity or alkalinity, few or no rocks, and permeability to air and water. Prime farmland is not excessively erodible, is not saturated with water for long periods, and is not flooded during the growing season. The slope range is mainly from 0 to 6 percent. For more detailed information on the criteria for prime farmland, consult the local staff of the Soil Conservation Service.

About 32,500 acres, or nearly 17 percent of Nassau County, meets the soil requirements for prime farmland. The areas are throughout the county, but most are in the northern part. The main crops on this land are vegetables, fruits, and nursery stock. Some areas are in pasture or hay on horse farms. Many areas are in native vegetation and in large estates, preserves, and parks.

The soil map units that make up prime farmland in Nassau County are listed in table 5. This list does not constitute a recommendation for a particular land use. The extent of each listed map unit is shown in table 4. The location is shown on the detailed soil maps in the back of this publication. The soil qualities that affect use and management are described in the section "Detailed Soil Map Units."

Some soils that have a high water table are classified as prime farmland if the limitation is overcome by drainage. In table 5 the need for drainage is indicated in parentheses after the map unit name. Onsite evaluation is necessary to see if the water table has been overcome by corrective measures.

Use and Management of the Soils

This soil survey is an inventory and evaluation of the soils in the survey area. It can be used to adjust land uses to the limitations and potentials of natural resources and the environment. Also, it can help avoid soil-related failures in land uses.

In preparing a soil survey, soil scientists, conservationists, engineers, and others collect extensive field data about the nature and behavior characteristics of the soils. They collect data on erosion, droughtiness, flooding, and other factors that affect various soil uses and management. Field experience and collected data on soil properties and performance are used as a basis in predicting soil behavior.

Information in this section can be used to plan the use and management of soils for fruit and vegetables; for trees and shrubs; as sites for buildings, sanitary facilities, highways and other transportation systems, and parks and other recreation facilities; and for wildlife habitat. It can be used to identify the potentials and limitations of each soil for specific land uses and to help prevent construction failures caused by unfavorable soil properties.

Planners and others using soil survey information can evaluate the effect of specific land uses on productivity and on the environment in all or part of the survey area. The survey can help planners to maintain or create a land use pattern in harmony with the natural soil.

Contractors can use this survey to locate sources of sand and gravel, roadfill, and topsoil. They can use it to identify areas where wetness or very firm soil layers can cause difficulty in excavation.

Health officials, highway officials, engineers, and others may also find this survey useful. The survey can help them plan the safe disposal of wastes and locate sites for pavements, sidewalks, campgrounds, playgrounds, lawns, and trees and shrubs.

Garden Crops, Fruits, and Flowers

Laura A. Zaimes, soil conservationist, Soil Conservation Service, and William J. Sanok, vegetable crop specialist, Cooperative Extension Service, assisted with the preparation of this section.

General management needed for vegetables, fruits, and flowers is given in this section, and a suitability rating is provided for each soil for production of various groups of vegetables, flowers, and fruits.

Examples of the types of crops rated in table 6 are as follows: Perennial vegetables—asparagus, rhubarb, fall-planted vegetables. Perennial flowers—lilies, iris, tulips, herbs. Annual vegetables—tomatoes, sweet corn, potatoes, lettuce, beans, squash, melons, onions. Annual flowers—petunias, marigolds, sunflowers. Fruit—apples, cherries, peaches, blackberries, grapes.

Most garden and fruit crops and flowers do well in loamy, permeable, well drained soils that have a medium to high available water capacity, have good tilth, and are warm early in spring (fig. 14). Most of the soils in Nassau County are naturally extremely acid to moderately acid. Most garden crops do better when soil reaction is moderately acid to neutral, but some crops, such as potatoes and tomatoes, tolerate acid soils.

Table 6 provides a suitability rating for the soils in the survey area for: perennial vegetables, flowers, and strawberries; annual vegetables and flowers; and tree and small fruits. The soils are rated according to their relative productivity in their natural state, and the ratings are based on the experience of agronomists, extension agents, and soil conservationists.

External factors that have strong influence on crop growth, such as air drainage, presence of frost pockets, and amount of sunlight, are not considered in the ratings. The common rnanagement practices used to obtain long-term optimum productivity, however, are considered. Those practices are: use of proper planting and seeding rates; erosion control where required; use of high-yield plant varieties; appropriate and timely tillage; control of weeds, plant diseases, and harmful insects; maintaining optimum levels of nitrogen, phosphorus, potassium, and trace elements; use of crop residues, manure, and green-manure crops; and use of harvesting methods that ensure the smallest possible loss.

A rating of *very good* indicates that the soil has few or no limitations and is capable of sustaining high yields. A rating of *good* indicates that the soil has some minor limitations for production. Examples of such limitations are in the available water capacity, rooting depth, or growing season of the soil. *Fair* indicates that the soil has limitations that require special management needs, such as irrigation or drainage, to attain a high level of production. A rating of *poor* indicates that the soil has limitations of drainage, available water capacity, or slope or another characteristic that is difficult to overcome for a high level of production. A rating of *very poor* indicates that the soil has major limitations that nearly prevent production of the crops shown.

Figure 14.—A few areas in Nassau County, mainly Enfield and Montauk soils, are still used for vegetable production.

Some soils in the table are not rated. This indicates the soils are either not suited to the particular group of crops or the crops are not grown on these soils.

Some soils with a low rating often can be made as productive as those with a high rating through management practices such as drainage or irrigation. Even soils with a very poor rating, such as the Freetown and Manahawkin soils, can be productive if adequately drained.

The ratings show the suitability of the soil for the dominant crops that are generally grown, but in some instances the rating of a soil for a specific crop is higher than the rating that is shown on the table. For example, blueberries are classified as small fruits and are suitable for Berryland soils. In the table, however, the suitability rating of small fruits in general for Berryland soils is very poor.

Users of table 6 for small gardens or commercial farms should consider the information given in the section "Detailed Soil Map Units" to determine the soil characteristics that are limitations of a particular soil for fruit, vegetables, or flowers. Specific information for fruit, vegetables, and flowers and soil management information can be obtained from the local office of the Cooperative Extension Service or the Soil Conservation Service, and some towns in the county offer information about community gardening programs.

Land Capability Classification

Land capability classification shows, in a general way, the suitability of soils for most kinds of field crops. Crops that require special management are excluded. The soils are grouped according to their limitations for field crops, the risk of damage if they are used for crops, and the way they respond to management. The criteria used in grouping the soils do not include major and generally expensive landforming that would change slope, depth, or other characteristics of the soils, nor do they include possible but unlikely major reclamation projects.

Capability classification is not a substitute for interpretations designed to show suitability and limitations of groups of soils for woodland or for engineering purposes. The capability classification of each map unit is given in table 6.

In the capability system, soils are generally grouped at three levels: capability class, subclass, and unit. Only class and subclass are used in this survey. The levels are defined in the following paragraphs.

Capability classes, the broadest groups, are designated by Roman numerals I through VIII. The numerals indicate progressively greater limitations and narrower choices for practical use. The classes are defined as follows:

Class I soils have slight limitations that restrict their use.

Class II soils have moderate limitations that reduce the choice of plants or that require moderate conservation practices.

Class III soils have severe limitations that reduce the choice of plants or that require special conservation practices, or both.

Class IV soils have very severe limitations that reduce the choice of plants or that require very careful management, or both.

Class V soils are not likely to erode but have other limitations, impractical to remove, that limit their use.

Class VI soils have severe limitations that make them generally unsuitable for cultivation.

Class VII soils have very severe limitations that make them unsuitable for cultivation.

Class VIII soils and miscellaneous areas have limitations that nearly preclude their use for commercial crop production.

Capability subclasses are soil groups within one class. They are designated by adding a small letter, *e, w, s,* or *c,* to the class numeral, for example, IIe. The letter *e* shows that the main limitation is risk of erosion unless close-growing plant cover is maintained; *w* shows that water in or on the soil interferes with plant growth or cultivation (in some soils the wetness can be partly corrected by artificial drainage); *s* shows that the soil is limited mainly because it is shallow, droughty, or stony; and *c*, used in only some parts of the United States, shows that the chief limitation is climate that is very cold or very dry.

In class I there are no subclasses because the soils of this class have few limitations. Class V contains only the subclasses indicated by *w, s,* or *c* because the soils in class V are subject to little or no erosion. They have other limitations that restrict their use to pasture, woodland, wildlife habitat, or recreation.

Landscape Plantings

Laura A. Zaimes, soil conservationist, Soil Conservation Service, and Richard Weir III, horticultural specialist, and Maria Cinque, turfgrass specialist, Cooperative Extension Service, assisted with the preparation of this section.

This section describes some of the soils and plants suitable for different types of landscaping and gives some of the factors used in selecting plants for landscaping.

Ornamental Trees and Shrubs

Table 7 lists examples of deciduous and evergreen trees, shrubs, and ground cover that are suitable for landscaping on the soils indicated. Users of table 7 should consult local nurserymen, horticulturists, landscape architects, extension agents, or library references for many additional species that can be used on the soils. The 1972 Yearbook of Agriculture (*5*), for example, covers many aspects of landscaping in urban areas, especially effects of heat from pavements, salts, shade, and microclimates.

Many of the soils in Nassau County have been disturbed to some degree during excavation for utilities and foundations for buildings and during construction of roadways and walks. This is especially true of soils that are mapped in a complex with Urban land. The species in table 7 will ordinarily do well on the specified soils unless the soil has been severely altered, either physically or chemically. The closer the soil is to a manmade object, the more likely the disturbance. For instance, wood, brick, gypsum board, metal stripping, mortar, and other building materials are commonly discarded around the foundation of a building near construction. These items often are mixed into the backfill around the foundation. Also, some of the fill material brought into a construction site is different from the orignial soil at the site.

Practically all of the undisturbed or slightly disturbed soils in Nassau County are strongly acid to extremely acid and are generally suitable for plants that thrive on acidity, such as azaleas and rhododendrons. However, these commonly are planted close to foundations where the reaction in many instances is more alkaline because of construction activities or the mixing of building material with the soil. A reaction (pH) test for soils around foundations or in other severely disturbed areas will help determine the suitability of the soils for different plants.

Factors for Plant Selection

Shade. Any map unit that is dominated by Urban land has a high density of buildings. As a result, what little soil is available between or around the buildings is in shade much or part of the day.

Lime is seldom needed in shaded areas because practically all plants that thrive in shade also thrive in an acid soil. Examples of those plants are rhododendrons, hollies, grapes, azaleas, laurels, leucothoes, andromedas, and dogwoods. Mixing peat moss, humus, or compost into the soil and the planting hole improves the suitability of the soil for those species. Where lime is needed for lawn grasses, vegetables, flowers, or alkaline-loving trees and shrubs, agricultural or dolomitic limestone should be used instead of hydrated lime.

Wetness. Except for ferns and mosses, few plants thrive in wet soils, such as Berryland or Walpole soils. Some practices can be used to overcome the wetness before planting. Installing subsurface drainage is one method if the soil is permeable enough for excess water to move through the soil to the drain tile. Another approach is to use enough loamy fill material to establish a satisfactory rooting zone. In some low-lying areas the wetness is caused by runoff from adjacent slopes and accumulates as ponded water. In some of these areas drains or ditches are needed to intercept and divert the runoff. In urban areas, alleviating soil wetness is sometimes difficult because property-line restrictions limit outlets for subsurface drains or ditches, and they also limit some other choices. The Soil Conservation Service can provide advice on soil drainage.

Root zone. Generally, soils with a restricted root zone do not hold enough moisture for plants throughout the growing season. In urban areas there can be many such root restrictions that cause failures or poor growth. In many instances the restrictions are not obvious until a subsurface investigation discloses impermeable barriers, such as chunks of asphalt or concrete covered during grading and filling.

Where the Montauk soils and Scio till substratum soils have been severely graded during construction, the dense, compact layers in the substratum have been exposed or are within a few inches of the surface. The roots of shrubs, lawns, trees, and garden plants in those areas cannot penetrate the dense layers. Therefore, the plants have a limited amount of available moisture during dry seasons and are susceptible to frost heave during freeze-thaw periods. Also, tillage is difficult in areas where the substratum is exposed because the soil structure is poor and the substratum compact.

Where root-restricting layers are near the surface, the root zone can be thickened by adding topsoil and by mixing as much organic matter as possible into the original soil. This will increase the moisture holding capacity of the soil and improve tilth, thus providing a better medium for root development.

Compaction. A noncompacted soil with good structure and tilth is about 50 percent mineral soil particles and 50 percent pore space. When the soil is at the proper moisture content for tilling or spading, about half of the pore space is filled with water. Therefore, the best time for tilling is when the soil is about 50 percent mineral soil particles, 25 percent air, and 25 percent water. In a highly compacted soil, the pore space has been greatly reduced by machinery or foot traffic forcing mineral soil solids into the pore space. As a result, the soil holds less air and water and is less permeable.

Any soil that is naturally compact or has been compacted provides a poor environment for roots, which is reflected in the poor quality of the plant. Compaction is common in loamy soils that are in a complex with Urban land. Incorporating organic matter into at least the upper 12 inches of the soil and in the planting hole will improve tilth and provide a better environment for root development in a compacted soil. Organic matter can be added by using peat moss, decayed leaves, compost, and green-manure plants such as rye or buckwheat. Areas that are subject to further compaction-causing activities, such as foot traffic, can be protected by covering the surface with a mulch of pine bark, wood chips, or other locally available materials.

Droughtiness. Many soils in Nassau County, such as the sandy Plymouth soils and Udipsamments, are droughty. These soils have a low capacity to store moisture for plant growth. In dry years shallow-rooted trees, shrubs, and other plants on those soils are subject to injury, disease, and eventual death unless irrigation is used. Lawn grasses, which have shallow root systems, are particulary sensitive to drought. Browning of lawns in midsummer in these areas is common unless rains are frequent or sprinkler irrigation is used.

Increasing the available water capacity of a droughty soil will ensure that landscape plantings are successful and will reduce the amount of supplemental water needed. Mixing peat moss or compost into the planting hole, tilling green-manure plants into the surface layer, and spreading or mixing fill material at sites with a sandy surface layer will increase available water capacity. Covering a newly planted area with a temporary mulch, such as straw or wood chips, prevents evaporation in the upper few inches of the soil until the plants become established.

Selecting a plant variety with a deep rooting system or a tolerance for drought will help to overcome droughtiness. Trees that have a shallow, spreading root system, such as Norway maple, can draw excessive moisture from nearby plantings.

Salt. Injury to plants from salt occurs mainly when man uses the salt to deice walks, driveways, city streets, and highways (*6*). Most of the hazard is in areas within splash distance of streets and gutters or where runoff from driveways and walks flows onto landscape plantings.

Salt injury to trees, shrubs, and vines appears as burns on the tips or margins of leaves, and eventually the burned leaves drop off the plant. This may be followed by dieback of stems and eventual death of the plant. On most nonwoody plants, the leaves, stems, flowers, and fruit are small. Therefore, stunting and, in

extreme cases, death are usually the only observable effects of salt injury.

Salt concentration in water draining off highways and streets sometimes is so high that no plant suitable for the area is able to survive, but some plants are more tolerant than others. Most shrubs are moderately tolerant of salt. Among the most sensitive plants are Algerian ivy, burford holly, rose, winged euonymus, and redtwig dogwood. Blue spruce and white pine are trees sensitive to salt. The tolerant trees are black locust, honey locust, ponderosa pine, eastern redcedar, white oak, red oak, spreading juniper, and arborvitae.

Growing ornamental plants is especially difficult along ocean shorelines because of salt spray. When choosing plants that are tolerant of salt spray, it is equally important to select the ones that are best suited to the site conditions. Japanese black pine, for example, is a suitable tree for a screen planting to protect lower-growing varieties from wind and blowing sand. American beachgrass planted on the windward side of a dune, the top of a bulkhead, or the side of a bluff will tolerate salt spray and anchor and bind the sandy soil. Cordgrasses is suitable for the wet, salty environment of low-lying tidal areas that are inundated by daily tides or storm tides.

Leaching is one way of reducing the salt content of some soils to a tolerable level. Leaching is done by applying more water to the planted area than can evaporate or be used by the plant so that the water and salt can drain to an area in the soil below the roots. Leaching is especially effective in well drained to excessively drained, permeable soils, such as Plymouth or Riverhead soils or Udipsamments.

Planting areas that are most susceptible to salt damage, for example, intersections, traffic circles, and corner sidewalks, are also most susceptible to heavy pedestrian traffic. For that reason, damage by pedestrian traffic is sometimes mistaken for damage by salt.

Air Pollution. Three of the most pernicious pollutants in Nassau County are ozone, PAN (peroxyacetal nitrate), and sulfur dioxide. Ozone and PAN are photochemical pollutants. Oxides of nitrogen in the air, in the presence of sunlight, react with oxygen to form ozone. Similarly, PAN is formed in sunlight by the chemical combination of nitrogen oxides and hydrocarbons in the atmosphere. The general symptoms of injury from ozone and PAN are spotted, streaked, and bleached leaves; retarded plant growth; and early leaf drop. In some instances the symptoms are the same as those from disease, insects, or limitations in the soil. Pines are the least tolerant to air pollution, which causes a bleached banding on the needles.

Among the annuals most sensitive to ozone are geranium, petunia, and wax begonia. Coleus, impatients, and verbena show only intermediate sensitivity. Examples of the kinds of annuals susceptible to injury from PAN are China aster, petunia, and impatiens. Those species that are resistent to it are balsam, calendula, coleus, Madagascar periwinkle, and wax begonia.

As a general rule, small-leaved plants are more resistant to air pollutants than large-leaved plants. Also, slow-growing plants are more resistent than rapidly growing plants, which have soft tissue.

Planting Trees and Shrubs

Preparing the soil for planting is critical, especially in urban areas where the soils have been severely disturbed.

In many parts of the map units dominated by Urban land, the original soil material has been graded, cut, filled, or compacted or all of these. Some of these soils have been chemically altered by salt, oil, lime, or other compounds from building activity. Preparing the planting area lessens the risk of losing an ornamental in these areas. The local office of the Cooperative Extension Service or a local nurseryman can provide information on suitable site preparation for ornamentals.

Trees and Shrubs for Noise Abatement

Noise from car traffic in urban areas can be screened by planting belts of trees and shrubs. One pattern consists of a double row of shrubs 6 to 8 feet tall nearest the traffic and a backing of rows of trees 15 to 30 feet tall (*7*). Evergreens or deciduous varieties that retain their leaves most of the year are suitable for year-round noise screening. Improper placement of shade trees used for beautification and noise abatement causes hazards of frost heaving to sidewalks, damage to utility lines and storm drains, and injury to the tree from salt.

Ground Cover and Vines

A ground cover is suitable for areas in which topography, shade, or other factors make it impractical to grow grass.

The general requirements for a ground cover plant are: suitability for the conditions to which it is subjected; growth rate rapid enough to cover and protect the soil; easy propagation; and generally low growing. Two factors that help to determine the degree of success of a ground cover are the preparation of a weed-free bed prior to planting and the use of mulch to control weed growth until the plants are mature.

Lawn Grasses

Selection of a suitable lawn grass blend or mixture is basic in establishing a long-lasting and attractive lawn. Lawn grasses differ in their ability to tolerate soil, shade, moisture stress, disease, organisms and insects, fertility, pH, mowing, and traffic. Kentucky bluegrasses and turf-type perennial ryegrasses and fine fescues are the primary lawn grasses used in this area.

Grasses for shaded areas. There are two main limitations for lawns in shade: (1) The low light intensity; (2) competition from the shade trees for water and nutrients. Shade also commonly restricts air movement or increases surface moisture, thereby creating humid, disease-favoring conditions. Moderate temperatures, however, are an advantage of shade.

Pruning trees to let in as much light as possible and immediately removing fallen leaves and branches are two examples of management used for lawns or turf in shade and are especially important in highly urbanized areas where buildings cast shade for long periods. Using shade-tolerant grasses, using minimum amounts of nitrogen when trees are in full leaf, maintaining an adequate level of nutrients for trees and grass, maintaining the soil pH between 6.5 and 7.0, irrigating deeply but infrequently, and using needed fungicides help to improve the suitability of lawns in shaded area.

Of the shade-tolerant grasses, red fescue is the most tolerant and is suitable for any grass mixture for shaded conditions. Chewing fescue is slightly less tolerant and more bunchy than red fescue. Several varieties of Kentucky bluegrass do well in partial shade when mixed with other shade-tolerant grasses. A suitable mixture consists of Kentucky bluegrass, a species that is shade tolerant, and one that is resistant to powdery mildew. Examples of varieties that have one or both of these properties are Bensun, Eclipse, Glade, and Touchdown.

Grasses for sunny areas. Kentucky bluegrass in combination with turf-type perennial ryegrasses are suitable for sunny locations.

The bluegrasses are especially suitable for areas where temperatures are cool during the growing season and the soil has adequate moisture and good drainage. Kentucky bluegrass will deteriorate under dense shade or on soils with poor drainage, low fertility, and low pH, or if subjected to close mowing. Typically, nonirrigated bluegrass goes dormant during hot summer months and turns brownish, but it often recovers in late summer and in fall. Because no one variety of Kentucky bluegrass is resistant to all diseases, most healthy lawns contain a blend of two or more varieties of bluegrass mixed with a turf-type perennial ryegrass.

Perennial ryegrasses germinate and develop more rapidly than most other turf grasses, thus providing a quick cover. Many improved turf-type varieties of ryegrasses, such as All-Star, Omega, Yorktown II, Manhattan II, and Citation, mix well with other lawn grasses. Lawns with these mixtures require mowing that is frequent but not too close to the surface and a good fertilization program.

Zoysia is sometimes selected for lawns in Nassau County. Zoysia, however, is a warm-season grass that remains brown and dormant for 6 to 7 months of the year, is slow spreading, and takes 2 years or more to cover the surface.

Grasses for heavy-use areas. Heavy foot traffic harms lawns directly by damaging the plants and indirectly by compacting the soil, thereby excluding air and water from the roots.

In small areas, one of the most common forms of a high-traffic area is the shortcut path. In these areas, consideration should be given to paving a walkway, using stepping stones or gravel walks, or landscaping the area with shrubs so that traffic will use existing paved walks. In relatively sheltered locations, where soil blowing is not a problem, wood chips can be used for the pathway.

Tall fescue is generally suitable for larger areas, such as athletic fields and playgrounds. Tall fescue produces a coarse, tough turf and tolerates poor drainage, summer heat, and drought better than most other grasses. Its use in a mixture with other grasses provides an even playing surface and attractive overall appearance. Among the improved varieties of tall fescue are Jaguar, Rebel, Houndog, and Falcon.

Recreation

The soils of the survey area are rated in table 8 according to limitations that affect their suitability for recreation. The ratings are based on restrictive soil features, such as wetness, slope, and texture of the surface layer. Susceptibility to flooding is considered. Not considered in the ratings, but important in evaluating a site, are the location and accessibility of the area, the size and shape of the area and its scenic quality, vegetation, access to water, potential water impoundment sites, and access to public sewerlines. The capacity of the soil to absorb septic effluent and the ability of the soil to support vegetation are also important. Soils subject to flooding are limited for recreation use by the duration and intensity of flooding and the season when flooding occurs. In planning recreation facilities, onsite assessment of the height, duration, intensity, and frequency of flooding is essential.

In table 8, the degree of soil limitation is expressed as slight, moderate, or severe. *Slight* means that soil properties are generally favorable and that limitations are minor and easily overcome. *Moderate* means that limitations can be overcome or alleviated by planning, design, or special maintenance. *Severe* means that soil properties are unfavorable and that limitations can be offset only by costly soil reclamation, special design, intensive maintenance, limited use, or by a combination of these measures.

The information in table 8 can be supplemented by other information in this survey, for example, interpretations for effluent absorption fields in table 11 and interpretations for dwellings without basements and for local roads and streets in table 10.

Camp areas require site preparation, such as shaping and leveling the tent and parking areas, stabilizing roads

and intensively used areas, and installing sanitary facilities and utility lines. Camp areas are subject to heavy foot traffic and some vehicular traffic. The best soils have mild slopes and are not wet or subject to flooding during the period of use. The surface has few or no stones or boulders, absorbs rainfall readily but remains firm, and is not dusty when dry. Strong slopes and stones or boulders can greatly increase the cost of constructing campsites.

Picnic areas are subject to heavy foot traffic. Most vehicular traffic is confined to access roads and parking areas. The best soils for picnic areas are firm when wet, are not dusty when dry, are not subject to flooding during the period of use, and do not have slopes or stones or boulders that increase the cost of shaping sites or of building access roads and parking areas.

Playgrounds require soils that can withstand intensive foot traffic. The best soils are almost level and are not wet or subject to flooding during the season of use. The surface is free of stones and boulders, is firm after rains, and is not dusty when dry. If grading is needed, the depth of the soil over bedrock or a hardpan should be considered.

Paths and trails for hiking and horseback riding should require little or no cutting and filling. The best soils are not wet, are firm after rains, are not dusty when dry, and are not subject to flooding more than once a year during the period of use. They have moderate slopes and few or no stones or boulders on the surface.

Golf fairways are subject to heavy foot traffic and some light vehicular traffic. Cutting or filling may be required. The best soils for use as golf fairways are firm when wet, are not dusty when dry, and are not subject to prolonged flooding during the period of use. They have moderate slopes and no stones or boulders on the surface. The suitability of the soil for tees or greens is not considered in rating the soils.

Wildlife Habitat

Robert E. Myers, wildlife biologist, Soil Conservation Service, assisted with the preparation of this section.

Ringnecked pheasants and bobwhite quail and a few red fox inhabit areas in the northern part of the county where grass and weed fields and hedgerow remnants of old farms still exist on the large estates. Many other species of wildlife have adapted to the urban and suburan environments. Cottontail rabbits, for example, inhabit the suburan grassy areas that are adjacent to shrubs and trees. Gray squirrels and raccoons are throughout the county in areas with stands of large mature trees.

Songbirds are common throughout the county; their greatest diversity is along the shorelines, around wetlands, and in shrubby wooded areas. Backyards that have trees, shrubs, and evergreens are attractive to a variety of birds. In the urban areas English sparrows, grackles, red-wing blackbirds, mockingbirds, cardinals, house finches, starlings, mourning doves, and pigeons are the dominant species.

Waterfowl are common on both shores. Ducks and gulls use nearly all the ponds and streams throughout the county. Canada geese and brants frequent open areas and graze on lawns, parks, and golf courses.

Soils affect the kind and amount of vegetation that is available to wildlife as food and cover. They also affect the construction of water impoundments. The kind and abundance of wildlife depend largely on the amount and distribution of food, cover, and water. Wildlife habitat can be created or improved by planting appropriate vegetation, by maintaining the existing plant cover, or by promoting the natural establishment of desirable plants.

In table 9, the soils in the survey area are rated according to their potential for providing habitat for various kinds of wildlife. This information can be used in planning parks, wildlife refuges, nature study areas, and other developments for wildlife; in selecting soils that are suitable for establishing, improving, or maintaining specific elements of wildlife habitat; and in determining the intensity of management needed for each element of the habitat.

The potential of the soil is rated good, fair, poor, or very poor. A rating of *good* indicates that the element or kind of habitat is easily established, improved, or maintained. Few or no limitations affect management, and satisfactory results can be expected. A rating of *fair* indicates that the element or kind of habitat can be established, improved, or maintained in most places. Moderately intensive management is required for satisfactory results. A rating of *poor* indicates that limitations are severe for the designated element or kind of habitat. Habitat can be created, improved, or maintained in most places, but management is difficult and must be intensive. A rating of *very poor* indicates that restrictions for the element or kind of habitat are very severe and that unsatisfactory results can be expected. Creating, improving, or maintaining habitat is impractical or impossible.

The elements of wildlife habitat are described in the following paragraphs.

Grain and seed crops are domestic grains and seed-producing herbaceous plants. Soil properties and features that affect the growth of grain and seed crops are depth of the root zone, texture of the surface layer, available water capacity, wetness, slope, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of grain and seed crops are corn, wheat, oats, and barley.

Grasses and legumes are domestic perennial grasses and herbaceous legumes. Soil properties and features that affect the growth of grasses and legumes are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, flood hazard, and slope. Soil temperature and soil moisture are also

considerations. Examples of grasses and legumes are fescue, switchgrass, timothy, bromegrass, clover, and alfalfa.

Wild herbaceous plants are native or naturally established grasses and forbs, including weeds. Soil properties and features that affect the growth of these plants are depth of the root zone, texture of the surface layer, available water capacity, wetness, surface stoniness, and flood hazard. Soil temperature and soil moisture are also considerations. Examples of wild herbaceous plants are bluestem, goldenrod, beggartick, dandelion, and asters.

Hardwood trees and woody understory produce nuts or other fruit, buds, catkins, twigs, bark, and foliage. Soil properties and features that affect the growth of hardwood trees and shrubs are depth of the root zone, available water capacity, and wetness. Examples of these plants are oak, birch, cherry, maple, apple, hawthorn, dogwood, hickory, blackberry, and blueberry. Examples of fruit-producing shrubs that are suitable for planting on soils rated *good* are gray dogwood, autumn-olive, and crabapple.

Coniferous plants furnish browse and seeds. Soil properties and features that affect the growth of coniferous trees, shrubs, and ground cover are depth of the root zone, available water capacity, and wetness. Examples of coniferous plants are pine, spruce, yew, cedar, and hemlock.

Wetland plants are annual and perennial wild herbaceous plants that grow on moist or wet sites. Submerged or floating aquatic plants are excluded. Soil properties and features affecting wetland plants are texture of the surface layer, wetness, reaction, salinity, slope, and surface stoniness. Examples of wetland plants are smartweed, arrowhead, burreed, pickerel weed, cordgrass, rushes, sedges, and reeds.

Shallow water areas have an average depth of less than 5 feet. Some are naturally wet areas. Others are created by dams, levees, or other water-control structures. Soil properties and features affecting shallow water areas are depth to bedrock, wetness, surface stoniness, slope, and permeability. Examples of shallow water areas are marshes, swamps, and ponds.

The habitat for various kinds of wildlife is described in the following paragraphs.

Habitat for openland wildlife consists of cropland, pasture, meadows, and areas that are overgrown with grasses, herbs, shrubs, and vines. These areas produce grain and seed crops, grasses and legumes, and wild herbaceous plants. The wildlife attracted to these areas include bobwhite quail, meadow vole, meadowlark, field sparrow, cottontail, and red fox.

Habitat for woodland wildlife consists of areas of deciduous plants or coniferous plants or both and associated grasses, legumes, and wild herbaceous plants. Wildlife attracted to these areas include woodcock, thrushes, woodpeckers, squirrels, raccoon, and opossum.

Habitat for wetland wildlife consists of open, marshy or swampy shallow water areas. Some of the wildlife attracted to such areas are ducks, geese, herons, shore birds, muskrat, mink, frogs, and tree swallows.

Engineering

This section provides information for planning land uses related to urban development and to water management. Soils are rated for various uses, and the most limiting features are identified. The ratings are given in the following tables: Building site development, Sanitary facilities, Construction materials, and Water management. The ratings are based on observed performance of the soils and on the estimated data and test data in the "Soil Properties" section.

Information in this section is intended for land use planning, for evaluating land use alternatives, and for planning site investigations prior to design and construction. The information, however, has limitations. For example, estimates and other data generally apply only to that part of the soil within a depth of 5 or 6 feet. Because of the map scale, small areas of different soils may be included within the mapped areas of a specific soil.

The information is not site specific and does not eliminate the need for onsite investigation of the soils or for testing and analysis by personnel experienced in the design and construction of engineering works.

Government ordinances and regulations that restrict certain land uses or impose specific design criteria were not considered in preparing the information in this section. Local ordinances and regulations need to be considered in planning, in site selection, and in design.

Soil properties, site features, and observed performance were considered in determining the ratings in this section. During the fieldwork for this soil survey, determinations were made about grain-size distribution, liquid limit, plasticity index, soil reaction, soil wetness, depth to a seasonal high water table, slope, likelihood of flooding, natural soil structure aggregation, and soil density. Data were collected about kinds of clay minerals, mineralogy of the sand and silt fractions, and the kind of adsorbed cations. Estimates were made for erodibility, permeability, corrosivity, shrink-swell potential, available water capacity, and other behavioral characteristics affecting engineering uses.

This information can be used to (1) evaluate the potential of areas for residential, commercial, industrial, and recreation uses; (2) make preliminary estimates of construction conditions; (3) evaluate alternative routes for roads, streets, highways, pipelines, and underground cables; (4) evaluate alternative sites for sanitary landfills, septic tank absorption fields, and sewage lagoons; (5) plan detailed onsite investigations of soils and geology;

(6) locate potential sources of gravel, sand, earthfill, and topsoil; (7) plan drainage systems, irrigation systems, ponds, terraces, and other structures for soil and water conservation; and (8) predict performance of proposed small structures and pavements by comparing the performance of existing similar structures on the same or similar soils.

The information in the tables, along with the soil maps, the soil descriptions, and other data provided in this survey can be used to make additional interpretations.

Some of the terms used in this soil survey have a special meaning in soil science and are defined in the Glossary.

Building Site Development

Table 10 shows the degree and kind of soil limitations that affect shallow excavations, dwellings with and without basements, small commercial buildings, local roads and streets, and lawns and landscaping. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required. Special feasibility studies may be required where the soil limitations are severe.

Shallow excavations are trenches or holes dug to a maximum depth of 5 or 6 feet for basements, graves, utility lines, open ditches, and other purposes. The ratings are based on soil properties, site features, and observed performance of the soils. The ease of digging, filling, and compacting is affected by a fragipan, or a very firm dense layer; stone content; soil texture; and slope. The time of the year that excavations can be made is affected by the depth to a seasonal high water table and the susceptibility of the soil to flooding. The resistance of the excavation walls or banks to sloughing or caving is affected by soil texture and the depth to the water table.

Dwellings and small commercial buildings are structures built on shallow foundations on undisturbed soil. The load limit is the same as that for single-family dwellings no higher than three stories. Ratings are made for small commercial buildings without basements, for dwellings with basements, and for dwellings without basements. The ratings are based on soil properties, site features, and observed performance of the soils. A high water table, flooding, shrink-swell potential, and organic layers can cause the movement of footings. A high water table, depth to bedrock or to a cemented pan, large stones, slope, and flooding affect the ease of excavation and construction. Landscaping and grading that require cuts and fills of more than 5 to 6 feet are not considered.

Local roads and streets have an all-weather surface and carry automobile and light truck traffic all year. They have a subgrade of cut or fill soil material, a base of gravel, crushed rock, or stabilized soil material, and a flexible or rigid surface. Cuts and fills are generally limited to less than 6 feet. The ratings are based on soil properties, site features, and observed performance of the soils. Depth to bedrock or to a cemented pan, a high water table, flooding, large stones, and slope affect the ease of excavating and grading. Soil strength (as inferred from the engineering classification of the soil), shrink-swell potential, frost-action potential, and depth to a high water table affect the traffic-supporting capacity.

Lawns and landscaping require soils on which turf and ornamental trees and shrubs can be established and maintained. The ratings are based on soil properties, site features, and observed performance of the soils. Soil reaction, a high water table, depth to bedrock or to a very firm dense layer, available water capacity in the upper 40 inches, and the content of salts, sodium, and sulfidic materials affect plant growth. Flooding, wetness, slope, stoniness, and the amount of sand, clay, or organic matter in the surface layer affect trafficability after vegetation is established.

Sanitary Facilities

Table 11 shows the degree and kind of soil limitations that affect effluent absorption fields, sewage lagoons, and sanitary landfills. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increases in construction costs, and possibly increased maintenance are required.

Table 11 also shows the suitability of the soils for use as daily cover for landfills. A rating of *good* indicates that soil properties and site features are favorable for the use and good performance and low maintenance can be expected; *fair* indicates that soil properties and site features are moderately favorable for the use and one or more soil properties or site features make the soil less desirable than the soils rated good; and *poor* indicates that one or more soil properties or site features are unfavorable for the use and overcoming the unfavorable properties requires special design, extra maintenance, or costly alteration.

Effluent absorption fields are areas in which effluent from a cesspool or septic tank is distributed into the soil. Only that part of the soil between depths of 24 and 72

inches is evaluated. The ratings are based on soil properties, site features, and observed performance of the soils. Permeability, a high water table, depth to a firm dense layer, and flooding affect absorption of the effluent. Large stones and a firm dense layer interfere with installation.

Unsatisfactory performance of effluent absorption fields, including excessively slow absorption of effluent, surfacing of effluent, and hillside seepage, can affect public health. Ground water can be polluted if highly permeable sand and gravel or fractured bedrock is less than 4 feet below the base of the absorption field, if slope is excessive, or if the water table is near the surface. There must be unsaturated soil material beneath the absorption field to filter the effluent effectively. Many local ordinances require that this material be of a certain thickness.

Sewage lagoons are shallow ponds constructed to hold sewage while aerobic bacteria decompose the solid and liquid wastes. Lagoons should have a nearly level floor surrounded by cut slopes or embankments of compacted soil. Lagoons generally are designed to hold the sewage within a depth of 2 to 5 feet. Nearly impervious soil material for the lagoon floor and sides is required to minimize seepage and contamination of ground water.

Table 11 gives ratings for the natural soil that makes up the lagoon floor. The surface layer and, generally, 1 or 2 feet of soil material below the surface layer are excavated to provide material for the embankments. The ratings are based on soil properties, site features, and observed performance of the soils. Considered in the ratings are slope, permeability, a high water table, depth to bedrock or to a firm dense layer, flooding, large stones, and content of organic matter.

Excessive seepage due to rapid permeability of the soil or a water table that is high enough to raise the level of sewage in the lagoon causes a lagoon to function unsatisfactorily. Pollution results if seepage is excessive or if floodwater overtops the lagoon. A high content of organic matter is detrimental to proper functioning of the lagoon because it inhibits aerobic activity. Slope, bedrock, and dense firm layers can cause construction problems, and large stones can hinder compaction of the lagoon floor.

Sanitary landfills are areas where solid waste is disposed of by burying it in soil. There are two types of landfill—trench and area. In a trench landfill, the waste is placed in a trench. It is spread, compacted, and covered daily with a thin layer of soil excavated at the site. In an area landfill, the waste is placed in successive layers on the surface of the soil. The waste is spread, compacted, and covered daily with a thin layer of soil from a source away from the site.

Both types of landfill must be able to bear heavy vehicular traffic. Both types involve a risk of ground water pollution. Ease of excavation and revegetation needs to be considered.

The ratings in table 11 are based on soil properties, site features, and observed performance of the soils. Permeability, depth to bedrock or to a firm dense layer, a high water table, slope, and flooding affect both types of landfill. Texture, stones and boulders, highly organic layers, soil reaction, and content of salts and sodium affect trench type landfills. Unless otherwise stated, the ratings apply only to that part of the soil within a depth of about 6 feet. For deeper trenches, a limitation rated slight or moderate may not be valid. Onsite investigation is needed.

Daily cover for landfill is the soil material that is used to cover compacted solid waste in an area type sanitary landfill. The soil material is obtained offsite, transported to the landfill, and spread over the waste.

Soil texture, wetness, coarse fragments, and slope affect the ease of removing and spreading the material during wet and dry periods. Loamy or silty soils that are free of large stones or excess gravel are the best cover for a landfill. Clayey soils are sticky or cloddy and are difficult to spread; sandy soils are subject to soil blowing.

After soil material has been removed, the soil material remaining in the borrow area must be thick enough over a firm dense layer or the water table to permit revegetation. The soil material used as final cover for a landfill should be suitable for plants. The surface layer generally has the best workability, more organic matter, and the best potential for plants. Material from the surface layer should be stockpiled for use as the final cover.

Construction Materials

Table 12 gives information about the soils as a source of roadfill, sand, gravel, and topsoil. The soils are rated *good, fair,* or *poor* as a source of roadfill and topsoil. They are rated as a *probable* or *improbable* source of sand and gravel. The ratings are based on soil properties and site features that affect the removal of the soil and its use as construction material. Normal compaction, minor processing, and other standard construction practices are assumed. Each soil is evaluated to a depth of 5 or 6 feet.

Roadfill is soil material that is excavated in one place and used in road embankments in another place. In this table, the soils are rated as a source of roadfill for low embankments, generally less than 6 feet high and less exacting in design than higher embankments.

The ratings are for the soil material below the surface layer to a depth of 5 or 6 feet. It is assumed that soil layers will be mixed during excavating and spreading. Many soils have layers of contrasting suitability within their profile. The table showing engineering index properties provides detailed information about each soil layer. This information can help determine the suitability

of each layer for use as roadfill. The performance of soil after it is stabilized with lime or cement is not considered in the ratings.

The ratings are based on soil properties, site features, and observed performance of the soils. The thickness of suitable material is a major consideration. The ease of excavation is affected by large stones, a high water table, and slope. How well the soil performs in place after it has been compacted and drained is determined by its strength (as inferred from the engineering classification of the soil) and shrink-swell potential.

Soils rated *good* contain significant amounts of sand or gravel or both. They have at least 5 feet of suitable material, low shrink-swell potential, few cobbles and stones, and slopes of 15 percent or less. Depth to the water table is more than 3 feet. Soils rated *fair* are more than 35 percent silt- and clay-sized particles and have a plasticity index of less than 10. They have moderate shrink-swell potential, slopes of 15 to 25 percent, or many stones. Depth to the water table is 1 to 3 feet. Soils rated *poor* have a plasticity index of more than 10, a high shrink-swell potential, many stones, or slopes of more than 25 percent. They are wet, and the depth to the water table is less than 1 foot. They may have layers of suitable material, but the material is less than 3 feet thick.

Sand and gravel are natural aggregates suitable for commercial use with a minimum of processing. Sand and gravel are used in many kinds of construction. Specifications for each use vary widely. In table 12, only the probability of finding material in suitable quantity is evaluated. The suitability of the material for specific purposes is not evaluated, nor are factors that affect excavation of the material.

The properties used to evaluate the soil as a source of sand or gravel are gradation of grain sizes (as indicated by the engineering classification of the soil), the thickness of suitable material, and the content of rock fragments. Kinds of rock, acidity, and stratification are given in the soil series descriptions. Gradation of grain sizes is given in the table on engineering index properties.

A soil rated as a probable source has a layer of clean sand or gravel or a layer of sand or gravel that is up to 12 percent silty fines. This material must be at least 3 feet thick and less than 50 percent, by weight, large stones. All other soils are rated as an improbable source. Coarse fragments of soft bedrock, such as shale and siltstone, are not considered to be sand and gravel.

Topsoil is used to cover an area so that vegetation can be established and maintained. The upper 40 inches of a soil is evaluated for use as topsoil. Also evaluated is the reclamation potential of the borrow area.

Plant growth is affected by toxic material and by such properties as soil reaction, available water capacity, and fertility. The ease of excavating, loading, and spreading is affected by rock fragments, slope, a water table, soil texture, and thickness of suitable material. Reclamation of the borrow area is affected by slope, a water table, rock fragments, bedrock, and toxic material.

Soils rated *good* have friable loamy material to a depth of at least 40 inches. They are free of stones and cobbles, have little or no gravel, and have slopes of less than 8 percent. They are low in content of soluble salts, are naturally fertile or respond well to fertilizer, and are not so wet that excavation is difficult.

Soils rated *fair* are sandy soils, loamy soils that have a relatively high content of clay, soils that have only 20 to 40 inches of suitable material, soils that have an appreciable amount of gravel, stones, or soluble salts, or soils that have slopes of 8 to 15 percent. The soils are not so wet that excavation is difficult.

Soils rated *poor* are very sandy or clayey, have less than 20 inches of suitable material, have a large amount of gravel, stones, or soluble salts, have slopes of more than 15 percent, or have a seasonal water table at or near the surface.

The surface layer of most soils is generally preferred for topsoil because of its organic matter content. Organic matter greatly increases the absorption and retention of moisture and nutrients for plant growth.

Water Management

Table 13 gives information on the soil properties and site features that affect water management. The degree and kind of soil limitations are given for pond reservoir areas; embankments, dikes, and levees; and aquifer-fed excavated ponds. The limitations are considered *slight* if soil properties and site features are generally favorable for the indicated use and limitations are minor and are easily overcome; *moderate* if soil properties or site features are not favorable for the indicated use and special planning, design, or maintenance is needed to overcome or minimize the limitations; and *severe* if soil properties or site features are so unfavorable or so difficult to overcome that special design, significant increase in construction costs, and possibly increased maintenance are required.

This table also gives for each soil the restrictive features that affect drainage, irrigation, and grassed waterways.

Pond reservoir areas hold water behind a dam or embankment. Soils best suited to this use have low seepage potential in the upper 60 inches. The seepage potential is determined by the permeability of the soil and the depth to fractured bedrock or other permeable material. Excessive slope can affect the storage capacity of the reservoir area.

Embankments, dikes, and levees are raised structures of soil material, generally less than 20 feet high, constructed to impound water or to protect land against overflow. In this table, the soils are rated as a source of material for embankment fill. The ratings apply to the soil

material below the surface layer to a depth of about 5 feet. It is assumed that soil layers will be uniformly mixed and compacted during construction.

The ratings do not indicate the ability of the natural soil to support an embankment. Soil properties to a depth even greater than the height of the embankment can affect performance and safety of the embankment. Generally, deeper onsite investigation is needed to determine these properties.

Soil material in embankments must be resistant to seepage, piping, and erosion and have favorable compaction characteristics. Unfavorable features include less than 5 feet of suitable material and a high content of stones or boulders, organic matter, or salts or sodium. A high water table affects the amount of usable material. It also affects trafficability.

Aquifer-fed excavated ponds are pits or dugouts that extend to a ground-water aquifer or to a depth below a permanent water table. Excluded are ponds that are fed only by surface runoff and embankment ponds that impound water 3 feet or more above the original surface. Excavated ponds are affected by depth to a permanent water table, permeability of the aquifer, and quality of the water as inferred from the salinity of the soil. The content of large stones affects the ease of excavation.

Drainage is the removal of excess surface and subsurface water from the soil. How easily and effectively the soil is drained depends on the depth to a compacted layer or to other layers that affect the rate of water movement; permeability; depth to a high water table or depth of standing water if the soil is subject to ponding; slope; susceptibility to flooding; subsidence of organic layers; and potential frost action. Excavating and grading and the stability of ditchbanks are affected by depth to a compacted pan, large stones, slope, and the hazard of cutbanks caving. The productivity of the soil after drainage is adversely affected by extreme acidity or by toxic substances in the root zone, such as salts, sodium, or sulfur. Availability of drainage outlets is not considered in the ratings.

Irrigation is the controlled application of water to supplement rainfall and support plant growth. The design and management of an irrigation system are affected by depth to the water table, the need for drainage, flooding, available water capacity, intake rate, permeability, erosion hazard, and slope. The construction of a system is affected by large stones and depth to bedrock or to a firm dense layer. The performance of a system is affected by the depth of the root zone, the amount of salts or sodium, and soil reaction.

Grassed waterways are natural or constructed channels, generally broad and shallow, that conduct surface water to outlets at a nonerosive velocity. Large stones, wetness, slope, and depth to a firm dense layer affect the construction of grassed waterways. A hazard of wind erosion, low available water capacity, restricted rooting depth, toxic substances such as salts or sodium, and restricted permeability adversely affect the growth and maintenance of the grass after construction.

Soil Properties

Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

Engineering Index Properties

Table 14 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

Depth to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil Series and Their Morphology."

Texture is given in the standard terms used by the U.S. Department of Agriculture (*9*). These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If the content of particles coarser than sand is as much as about 15 percent, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

Classification of the soils is determined according to the Unified soil classification system (*2*) and the system adopted by the American Association of State Highway and Transportation Officials (*1*).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as Pt. Soils exhibiting engineering properties of two groups can have a dual classification, for example, CL-ML.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. Additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

Rock fragments larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

Percentage (of soil particles) passing designated sieves is the percentage of the soil fraction less than 3 inches in diameter based on an ovendry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

Liquid limit and *plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The

estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are generally rounded to the nearest 5 percent. Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

Physical and Chemical Properties

Table 15 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

Clay as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earthmoving operations.

Moist bulk density is the weight of soil (ovendry) per unit volume. Volume is measured when the soil is at field moisture capacity, that is, the moisture content at 1/3 bar moisture tension. Weight is determined after drying the soil at 105 degrees C. In this table, the estimated moist bulk density of each major soil horizon is expressed in grams per cubic centimeter of soil material that is less than 2 millimeters in diameter. Bulk density data are used to compute shrink-swell potential, available water capacity, total pore space, and other soil properties. The moist bulk density of a soil indicates the pore space available for water and roots. A bulk density of more than 1.6 can restrict water storage and root penetration. Moist bulk density is influenced by texture, kind of clay, content of organic matter, and soil structure.

Permeability refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

Available water capacity refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

Soil reaction is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

Erosion factor K indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value, the more susceptible the soil is to sheet and rill erosion by water.

Erosion factor T is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

Organic matter is the plant and animal residue in the soil at various stages of decomposition. In table 15, the estimated content of organic matter is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

Soil and Water Features

Table 16 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

Hydrologic soil groups are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are thoroughly wet and receive precipitation from long-duration storms.

Some soils in table 16 are assigned to two hydrologic soil groups. Dual grouping is used for soils that have a seasonal high water table but can be drained. The first letter applies to the drained condition of the soil and the second letter to the undrained condition.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

Flooding, the temporary covering of the soil surface by flowing water, is caused by overflowing streams, by runoff from adjacent slopes, or by inflow from high tides. Shallow water standing or flowing for short periods after rainfall or snowmelt is not considered flooding. Standing water in swamps and marshes or in a closed depression is considered ponding.

Table 16 gives the frequency and duration of flooding and the time of year when flooding is most likely to occur.

Frequency, duration, and probable period of occurrence are estimated. Frequency generally is expressed as *none, rare, occasional, common,* or *frequent. None* means that flooding is not probable. *Rare* means that flooding is unlikely but possible under unusual weather conditions (there is a near 0 to 5 percent chance of flooding in any year). *Occasional* means that flooding occurs infrequently under normal weather conditions (there is a 5 to 50 percent chance of flooding in any year). *Frequent* means that flooding occurs often under normal weather conditions (there is more than a 50 percent chance of flooding in any year). *Common* is used when classification as occasional or frequent does not affect interpretations. Duration is expressed as *very brief* (less than 2 days), *brief* (2 to 7 days), *long* (7 days to 1 month), and *very long* (more than 1 month). The time of year that floods are most likely to occur is expressed in months. November-May, for example, means that flooding can occur during the period November through May. About two-thirds to three-fourths of all flooding occurs during the stated period.

The information on flooding is based on evidence in the soil profile, namely, thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons, which are characteristic of soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

High water table (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely, grayish colors or mottles in the soil. Indicated in table 16 are the depth to the seasonal high water table; the kind of water table, that is, *perched, artesian,* or *apparent;* and the months of the year that the water table commonly is highest. A water table that is seasonally high for less than 1 month is not indicated in table 16.

An *apparent* water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An *artesian* water table is under hydrostatic head, generally below an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A *perched* water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

The two numbers in the "High water table-Depth" column indicate the normal range in depth to a saturated zone. Depth is given to the nearest half foot. The first numeral in the range indicates the highest water level. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. "More than 6.0" indicates that the water table is below a depth of 6 feet or that the water table exists for less than a month.

Potential frost action is the likelihood of upward or lateral expansion of the soil caused by the formation of segregated ice lenses (frost heave) and the subsequent collapse of the soil and loss of strength on thawing. Frost action occurs when moisture moves into the freezing zone of the soil. Temperature, texture, density, permeability, content of organic matter, and depth to the water table are the most important factors considered in evaluating the potential for frost action. It is assumed that the soil is not insulated by vegetation or snow and is not artificially drained. Silty soils and highly structured clayey soils that have a high water table in winter are the most susceptible to frost action. Well drained, very gravelly, or very sandy soils are the least susceptible. Frost heave and low soil strength during thawing cause damage mainly to pavements and other rigid structures.

Risk of corrosion pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

Engineering Properties of the Geologic Deposits

Edward A. Fernau, soils engineer, New York State Department of Transportation, Soil Mechanics Bureau, prepared this section.

Nassau County comprises four geologic units that are divided according to engineering properties. Those units are: (1) glacial moraine; (2) glacial outwash; (3) organic deposits; (4) beaches, dune land, and tidal marsh. The glacial moraine and glacial outwash in the county have similar engineering properties. Both of those units are sand or sand- and gravel-size particles at some depth; however, finer textured surface and subsurface material overlies the sand and gravel in places. The organic deposits are muck or peat. Beaches are along the shores of Long Island, and they vary in particle size from cobblestones to fine sand. Dune land is near beaches, but it is mostly fine sand mounded by wind action. Tidal marsh consists of different proportions of organic matter and sand.

Glacial Moraine

Glacial moraine consists of three types of soils; those formed in sandy glacial till, such as the Montauk soils; those formed in a silty mantle over sandy glacial till, such as the Scio till substratum soils; and those that are steeper and that generally formed over water-sorted sand and gravel, such as the Plymouth and Riverhead soils. Glacial moraine is as much a landform designation as it is a geologic designation. The moraines are the hilly parts of Nassau County, and the topography consists of many hills and depressions. Since the engineering properties of the coarse-grained sand and gravel are similar, regardless of geologic origin, their engineering characteristics are determined to a large degree by the topographic differences.

Among the differences between the till and the outwash is the amount of fines in the soil. The glacial till contains more silt-size and clay-size particles than the water-sorted glacial outwash. Those particles generally decrease permeability, decrease compressibility, and increase the strength of the soils. Boulders and cobblestones also are throughout the soil. The wider range in gradation results in smaller voids and a more compact soil.

The topography of the moraines is perhaps the most severe limitation for engineering. The hummocks make cuts and fills necessary for almost any engineering project. The relative compactness of the glacial till makes excavation more difficult than in water-sorted materials. The coarse-grained soils have adequate strength to support high embankments. Settlement is by rearrangement of the soil particles rather than by the removal of water, and it generally occurs during construction. Subgrades of road cuts are not uniform in places because of the variable nature of the soils.

Depressions, or kettle holes, are within the moraines. These depressions contain organic matter, silty inwash from surrounding knobs, or water. Drainage of surface water is almost exclusively by infiltration. If the substratum is dense, as in the Montauk soils, infiltration is retarded.

Glacial Outwash

Glacial outwash is on broad, nearly level outwash plains south of the moraines. Slope generally is less than 3 percent except near drainageways. The soils formed in glacial outwash or in contrasting materials over stratified sand and gravel are on outwash plains. The soils that formed in glacial outwash are the Atsion, Berryland, Hempstead, Mineola, Plymouth, Riverhead, and Walpole soils. The soils that formed in contrasting finer textured material over sand and gravel are the Enfield, Scio, and Wallington soils.

A great amount of sorting and stratification generally is evident in outwash deposits. The grains are almost all sand-size or gravel-size, and they are rounded, which is the result of water transport. In general, the sandy or sandy and gravelly outwash material is loose.

The topography of outwash plains is such that most engineering works can be accomplished without extensive earthmoving. Embankments generally are constructed without difficulty, but some glacial outwash soils tend to pipe, slough, or cave in when placed in high embankments. The soils support high fills without excessive settlement. As with glacial tills, the settlement is through particle rearrangement and occurs quickly. Highway gradelines are generally at or near the existing ground surface on outwash plains. Because of the uniformity and roundness of the particles, trafficability for

wheeled vehicles is often limited. Compaction of highway subgrades and building subgrades is sometimes difficult to obtain because of the clean sand and gravel.

Drainage of surface water on outwash plains is mostly by infiltration. The porous soils readily soak up precipitation.

Organic Deposits

Organic deposits for the most part are accumulations of plant remains. In places they include a small amount of mineral soils. They are in very poorly drained depressions and bogs which are covered with water during much of the year.

Freetown soils formed in deep organic material, and Manahawkin soils formed in moderately deep organic material. Both soils are so wet, weak, and highly compressible that they are unsuitable as sites for foundations for engineering works. Use of these soils as sites for engineering works generally requires replacement of the organic material with suitable backfill. Filling over organic deposits will result in long-term settlement.

Beaches, Dune Land, Tidal Marsh

These areas generally are together in some combination. The beaches along the north shore are coarser in texture than those elsewhere on the island. The areas generally are narrow and terminate inland at an escarpment or bluff. Along the south shore the beaches are sandy and are on the barrier islands. On these islands the sequence of deposits generally is beach, dune land, and tidal marsh.

The soils in tidal marsh are the Ipswich, Matunuck, and Pawcatuck soils. Udorthents, wet substratum, are fill material over tidal marsh.

Beaches and the tidal marshes generally are not used for engineering purposes because of the high water levels and the organic material in the marshes. Dune land, which is sand mounded by wind action, generally is used as a site for highways and buildings because it is the highest land on the islands. Beaches, dune land, and Udipsamments generally consist of uniform, sand-size particles. They have adequate strength for embankments, and settlement is slight. In places between dunes, the water table is high. Erosion by wind and water is the major concern on beaches, dune land, and Udipsamments. Udipsamments, wet substratum, are dredged material that generally is fine sand deposited on mucky peat and is subject to wind erosion. Any construction on reclaimed land is subject to the hazards of differential or excessive settlement.

Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (*8*). Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. Table 17 shows the classification of the soils in the survey area. The categories are defined in the following paragraphs.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending in *sol*. An example is Inceptisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Aquent (*Aqu*, meaning water, plus *ept*, from Inceptisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haplaquepts (*Hapl*, meaning minimal horizonation, plus *aquept*, the suborder of the Inceptisols that have an aquic moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective *Aeric* identifies the subgroup that is thought to be better aerated than is typical for the great group. An example is Aeric Haplaquepts.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is sandy, mixed, mesic Aeric Haplaquepts.

SERIES. The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer or of the substratum can differ within a series.

Soil Series and Their Morphology

In this section, each soil series recognized in the survey area is described. The descriptions are arranged in alphabetic order.

Characteristics of the soil and the material in which it formed are identified for each series. The soil is compared with similar soils and with nearby soils of other series. A pedon, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the *Soil Survey Manual* (*9*). Many of the technical terms used in the descriptions are defined in *Soil Taxonomy* (*8*). Unless otherwise stated, colors in the descriptions are for moist soil. Following the pedon description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed Soil Map Units."

Atsion Series

The Atsion series consist of very deep, poorly drained soils that formed in deposits of deep glacial outwash. Slope ranges from 0 to 2 percent.

Atsion soils are in a drainage sequence with excessively drained Plymouth soils and very poorly drained Berryland soils. Atsion soils are near Manahawkin soils but are drier and do not have the thick organic mantle typical of Manahawkin soils.

Typical pedon of Atsion loamy sand, Town of Hempstead, 500 yards southwest of the intersection of

Mill Road and Rosedale Road, in the county waterworks plant near Hewlett:

Oi—1 inch to 0; leaf litter.
Oa—0 to 2 inches; black (10YR 2/1) muck; moderate medium granular structure; very friable; many fine roots; very strongly acid; abrupt smooth boundary.
A—2 to 5 inches; very dark gray (10YR 3/1) loamy sand; moderate fine and medium granular structure; very friable; many fine roots; very strongly acid; abrupt smooth boundary.
E—5 to 7 inches; grayish brown (10YR 5/2) sand; single grain; loose; common fine roots; very strongly acid; abrupt wavy boundary.
Bh—7 to 11 inches; black (5YR 2/1) loamy sand; massive; friable; few fine roots; very strongly acid; clear smooth boundary.
Bs—11 to 18 inches; dark reddish brown (5YR 2/2) loamy sand; pockets of reddish brown (5YR 4/3) massive; very friable; few fine roots; very strongly acid; abrupt irregular boundary.
BC—18 to 36 inches; dark grayish brown (10YR 4/2) loamy sand; few fine distinct brown (7.5YR 4/4) mottles; single grain; loose; 5 percent gravel; very strongly acid; gradual smooth boundary.
C—36 to 60 inches; light brownish gray (10YR 6/2) coarse sand; single grain; loose; 10 percent gravel; very strongly acid.

The solum thickness ranges from 20 to 40 inches. The content of rock fragments in the solum generally is less than 10 percent but ranges up to 20 percent in the substratum. Reaction is strongly acid or very strongly acid. Texture throughout the solum is sand or loamy sand.

The O horizon ranges from 2 to 8 inches in thickness.

The A horizon dominantly has 10YR hue or is neutral, has value is 2 or 3, and has chroma of 0 or 1. This horizon has weak or moderate granular structure, and consistence is friable or very friable.

The E horizon has hue of 10YR, value of 5 to 7, and chroma of 1 or 2.

The Bh horizon has hue of 5YR or 7.5YR, value of 2 or 3, and chroma of 1 or 2. Consistence ranges from firm to very friable.

The Bs horizon has hue of 5YR or 7.5YR, value of 2 to 4, and chroma of 2 to 4.

The BC horizon has hue of 10YR, value of 3 to 6, and chroma of 1 to 3.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 1 to 3. In some pedons it is stratified gravelly sand.

Berryland Series

The Berryland series consists of very deep, very poorly drained soils formed in deposits of sandy glacial outwash. The soils are in drainageways and swampy areas that are wet or waterlogged most of the year. Slope ranges from 0 to 1 percent.

Berryland soils are in a drainage sequence with excessively drained Plymouth soils and poorly drained Atsion soils. Berryland soils are near Manahawkin soils but do not have the thick organic mantle typical of Manahawkin soils.

Typical pedon of Berryland mucky loam sand, Town of Oyster Bay, in a wooded area of Massapequa Park, 500 feet west of the parking lot:

Oi—1 inch to 0; partially decomposed leaf mat.
Oa—0 to 5 inches; black (5YR 6/1) muck; weak coarse granular structure; very friable; many roots; extremely acid; abrupt smooth boundary.
E—5 to 8 inches; light gray (5YR 6/1) loamy sand; single grain; loose, nonsticky when wet; few roots; extremely acid; abrupt smooth boundary.
Bh—8 to 10 inches; dark reddish brown (5YR 2/2) loamy sand; weak fine subangluar blocky structure; very friable, slightly sticky when wet; few roots; weakly smeary; 5 percent fine gravel; extremely acid; abrupt wavy boundary.
Bhs—10 to 17 inches; dark reddish brown (5YR 2/2) loamy sand; single grain; loose, nonsticky when wet; few roots; 5 percent fine gravel; extremely acid; clear smooth boundary.
Bs1—17 to 27 inches; dark reddish brown (5YR 3/2) loamy coarse sand; single grain; loose, nonsticky when wet; 10 percent fine gravel; extremely acid; clear smooth boundary.
2Bs2—27 to 33 inches; dark brown (7.5YR 3/2) gravelly coarse sand; single grain; loose, nonsticky when wet; 30 percent fine gravel; very strongly acid; gradual smooth boundary.
2C—33 to 60 inches; grayish brown (10YR 5/2) very gravelly sand; single grain; loose, nonsticky when wet; 40 percent fine gravel; strongly acid.

The solum thickness ranges from 28 to 40 inches. The texture is muck or mucky peat in the organic material above the mineral soil. The mineral soil in the fine-earth fraction is coarse sand to loamy sand. The content of rock fragments, mostly fine gravel, ranges from none in the upper part of the solum to as much as 35 percent in the lower part of the solum. The substratum contains up to 50 percent fine gravel. The soil in the solum is extremely acid or very strongly acid. The C horizon is very strongly acid or strongly acid. The O horizon ranges from 1 inch to 15 inches in thickness.

The Oa horizon is neutral or has hue of 5YR to 10YR, value of 2, and chroma of 0 or 1. It is granular.

The E horizon is neutral or has hue of 5YR to 10YR, value of 5 or 6, and chroma of 0 to 2.

The Bh horizon has hue of 5YR to 10YR, value of 2 or 3, and chroma of 1 or 2.

The Bs horizon has hue of 5YR or 7.5YR, value of 3 or 4, and chroma of 2 or 3.

The C horizon has hue of 10YR to 2.5Y, value of 5 or 6, and chroma of 1 to 3.

Enfield Series

The Enfield series consists of very deep, well drained soils that formed in a mantle of eolian or water-laid deposits that overlie deposits of gravel and sand. The soils are on side slopes and tops of outwash plains. Slope ranges from 0 to 8 percent.

Enfield soils are near Plymouth, Riverhead, Hempstead, Scio, and Montauk soils. The Enfield soils have a finer textured subsoil than the Plymouth or Riverhead soils, have a lighter colored surface layer than the Hempstead soils, are better drained than the Scio soils, and do not have the dense substratum typical of the Montauk soils.

Typical pedon of Enfield silt loam, 0 to 3 percent slopes, in the town of North Hempstead, 200 feet north of NY Route 25 and 0.6 mile west of the intersection of NY Route 25 and Post Avenue:

Ap—0 to 10 inches; dark brown (10YR 3/3) silt loam; weak fine and medium granular structure; very friable; many fine and common medium roots; strongly acid; abrupt smooth boundary.

Bw1—10 to 22 inches; yellowish brown (10YR 5/4) silt loam; weak fine and medium subangular blocky structure; very friable; common fine and medium roots; strongly acid; clear smooth boundary.

Bw2—22 to 28 inches; yellowish brown (10YR 5/4) silt loam; medium subangular blocky structure; friable; few fine roots; strongly acid; clear smooth boundary.

Bw3—28 to 32 inches; yellowish brown (10YR 5/6) silt loam; weak medium subangular blocky structure; friable; few fine roots; 5 percent gravel; strongly acid; clear smooth boundary.

2BC—32 to 36 inches; brown (10YR 4/3) gravelly loamy sand; weak fine subangluar blocky structure; friable; 20 percent gravel; strongly acid; clear smooth boundary.

2C—36 to 60 inches; light yellowish brown (10YR 6/4) very gravelly sand; single grain; loose; 45 percent gravel; thin strata of fine and medium sand; strongly acid.

The solum thickness ranges from 15 to 40 inches and corresponds to the depth to sand and gravel. The content of rock fragments in the solum ranges mainly from 0 to 10 percent. Some thin subhorizons are as much as 25 percent rock fragments, but these are generally immediately above the 2C horizon. The gravel content in the 2C horizon ranges from 25 to 70 percent. The soil ranges from very strongly acid to moderately acid.

The A horizon has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 2 or 3. It is silt loam or very fine sandy loam.

The Bw1 horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 3 to 6. The Bw2 and Bw3 horizons have hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 3 to 6. The Bw horizon is silt loam or very fine sandy loam.

The BC horizon has colors similar to those in the lower part of the Bw horizon. The BC horizon is loamy sand or loamy fine sand or their gravelly analogs.

The 2C horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 1 to 6. It is stratified sand, very gravelly sand, gravelly sand, very gravelly fine sand, or coarse sand.

Freetown Series

The Freetown series consists of very deep, very poorly drained soils that formed in deposits of well decomposed organic material. Freetown soils are in broad depressions. Slope is less than 1 percent.

Freetown soils formed in material similar to that in which Manahawkin, Ipswich, and Pawcatuck soils formed. The Freetown soils are deeper to the underlying mineral soil than are the Manahawkin or Pawcatuck soils. The Freetown soils are not subject to daily tidal flooding as are the Ipswich and Pawcatuck soils.

Typical pedon of Freetown muck, in the town of North Hempstead, 0.5 mile north of Elm Point Road, in a town park near the ballfield:

Oa1—0 to 2 inches; black (5YR 2/1) broken face and rubbed muck; 5 percent unrubbed fiber, 2 percent rubbed; granular structure; very friable; common medium roots; herbaceous fiber; less than 5 percent mineral content; extremely acid; abrupt wavy boundary.

Oa2—2 to 7 inches; black (5YR 2/1) broken face muck dark reddish brown (5YR 2/2) rubbed; 10 percent unrubbed fiber, 2 percent rubbed; weak very fine subangular blocky structure; very friable; common medium roots; herbaceous fiber; less than 5 percent mineral content; extremely acid; clear wavy boundary.

Oa3—7 to 14 inches; dark reddish brown (5YR 2/2) broken face and rubbed muck; 5 percent unrubbed fiber, 2 percent rubbed; moderate fine subangular blocky structure; very friable; few fine roots; herbaceous fiber; less than 5 percent mineral content; extremely acid; clear wavy boundary.

Oa4—14 to 33 inches; dark reddish brown (5YR 2/2) broken face and rubbed muck; 20 percent unrubbed fiber, 2 percent rubbed; moderate medium subangular blocky structure; very friable; herbaceous fiber; less than 5 percent mineral content; extremely acid; clear wavy boundary.

Oa5—33 to 47 inches; dark reddish brown (5YR 2/2) broken face and rubbed muck; 30 percent unrubbed fiber, 10 percent rubbed; massive; very friable; herbaceous and woody fiber; less than 5 percent mineral content; extremely acid; clear wavy boundary.
Oa6—47 to 60 inches, dark reddish brown (5YR 3/2) broken face rubbed muck; 10 percent unrubbed fiber, 5 percent rubbed; massive; very friable; herbaceous and woody fiber; less than 5 percent mineral content; extremely acid.

The organic material extends to a depth of 51 inches or more. Cumulatively, the layers of hemic material are less than 10 inches thick and the fibric materials make up less than 5 inches of the subsurface and bottom tiers. Woody fragments are in some part of the profile and make up as much as 25 percent of some horizons. Reaction is extremely acid throughout the soil.

The surface tier is neutral or has hue of 5YR to 10YR, value of 2 or 3, and chroma of 0 to 2. It is dominantly sapric material.

The subsurface tier is neutral or has hue of 5YR to 10YR, value of 2 to 4, and chroma of 0 to 2. In some pedons the chroma or value, or both, change from 0.5 to 2 when rubbed. The subsurface layer is dominated by sapric material with a rubbed fiber content of less than 16 percent of the organic volume. Unrubbed organic material is herbaceous and woody plant tissue.

The bottom tier has colors similar to those in the subsurface layer. Unrubbed organic material has variable amounts of woody and herbaceous plant tissue.

Hempstead Series

The Hempstead series consists of very deep, well drained soils on outwash plains. The soils formed in a loamy mantle overlying stratified sand and gravel. Slope ranges from 0 to 3 percent.

Hempstead soils are in a drainage sequence with moderately well drained Mineola soils and are near Enfield and Riverhead soils. The Hempstead soils have a thick, dark surface layer that is not typical in the Enfield or Riverhead soils

Typical pedon of Hempstead silt loam, in an area of Urban land-Hempstead complex, in the town of Hempstead, 1,800 feet northwest of the intersection of Clinton Road and Stewart Avenue:

A—0 to 11 inches; black (10YR 2/1) silt loam; very dark grayish brown (10YR 3/2) dry; moderate fine roots; moderately acid; clear wavy boundary.
AB—11 to 15 inches; dark brown (10YR 4/3) silt loam; moderate fine subangular blocky structure; friable; many fine roots; strongly acid; clear smooth boundary.
Bw1—15 to 25 inches; yellowish brown (10YR 5/6) silt loam; moderate medium subangular blocky structure; friable; common fine roots; strongly acid; clear wavy boundary.
Bw2—25 to 29 inches; yellowish brown (10YR 5/8) silt loam; weak medium subangular blocky structure; very friable; few fine roots; 5 percent fine gravel; strongly acid; abrupt smooth boundary.
2BC—29 to 33 inches; strong brown (7.5YR 5/8) very gravelly loamy sand; very weak fine granular structure; very friable; 50 percent gravel; strongly acid; clear smooth boundary.
2C—33 to 60 inches; very pale brown (10YR 7/3) stratified sand and gravel; single grain; loose; 60 percent gravel; strongly acid.

The thickness of the solum ranges from 20 to 40 inches and corresponds closely to the depth to stratified sand and gravel. The rock fragment content ranges from 0 to 5 percent in the A and Bw horizons and from 25 to 65 percent in the 2BC and 2C horizons. The rock fragments are mainly gravel of granitic origin, but the 2BC and 2C horizons are up to 20 percent cobblestones. Reaction ranges from moderately acid to very strongly acid in the solum and is strongly acid or very strongly acid in the substratum.

The A horizon has hue of 10YR, value of 1 or 2, and chroma of 1 or 2. It is silt loam or very fine sandy loam.

The AB horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. It is silt loam or very fine sandy loam.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 4 to 8. It is silt loam or very fine sandy loam.

The 2BC horizon similar in color to the Bw horizon. The 2BC horizon is loamy sand or sandy loam in the fine-earth fraction.

The 2C horizon has hue of 7.5YR to 2.5Y, value of 5 to 7, and chroma of 3 or 4. It is sand or loamy sand in the fine-earth portion.

Ipswich Series

The Ipswich series consists of very deep, very poorly drained soils formed in partially decomposed organic material from salt-tolerant herbaceous plants. These soils are in tidal marshes near the ocean and are subject to inundation by saltwater twice daily. Slope is 0 to 1 percent.

Ipswich soils and Matunuck, Pawcatuck, Freetown, and Manahawkin soils are on similar landscapes. The Ipswich soils are deeper to the underlying mineral material than are the Matunuck and Pawcatuck soils. The Ipswich soils are subject to daily tidal flooding, while the Freetown and Manahawkin soils are not.

Typical pedon of Ipswich mucky peat, in the Town of Hempstead, 900 feet west of Meadowbrook Parkway and 1 mile north of the toll booth to Jones Beach State Park:

Oe1—0 to 4 inches; dark grayish brown (10YR 4/2) broken face mucky peat; very dark grayish brown (10YR 3/2) rubbed; 95 percent fiber, 55 percent rubbed; massive; dense mat of roots, stems, and leaves; very friable; many very fine, fine, medium, and coarse roots; herbaceous fibers; 30 percent silt and very fine sand; slightly acid; abrupt smooth boundary.
Oe2—4 to 21 inches; black (5Y 2/2) broken face mucky peat; dark gray (5Y 4/1) rubbed; 50 percent unrubbed fiber, 20 percent rubbed; massive; very friable; herbaceous fibers; 40 percent silt and very fine sand; neutral; abrupt smooth boundary.
Oe3—21 to 36 inches; very dark brown (10YR 2/2) broken face mucky peat; very dark gray (10YR 3/1) rubbed; 80 percent unrubbed fibers, 20 percent rubbed; massive; very friable; herbacceous fibers; 20 percent silt and very fine sand; neutral; abrupt smooth boundary.
Oa1—36 to 60 inches; dark olive gray (5Y 3/2) broken face muck; olive gray (5Y 4/2) rubbed; 40 percent unrubbed fiber, 5 percent rubbed; massive; very friable; herbaceous fibers; 30 percent silt and very fine sand; neutral.

The thickness of the organic deposits is more than 51 inches. The soil is moderately acid to mildly alkaline. Thin layers of very fine sand and silt in the organic material are common in some pedons.

The surface tier has hue of 10YR to 5Y, value of 2 to 4, and chroma of 0 to 3. The fiber content is 35 to 100 percent; the rubbed fiber content ranges from 20 to 75 percent. The mineral content is 5 to 60 percent.

The subsurface tier has hue of 10YR to 5Y, value of 2 to 4, and chroma of 0 to 3. The fiber content is 20 to 85 percent; the rubbed fiber content ranges mainly from 20 to 40 percent, but some layers up to 10 inches thick are 10 to 60 percent rubbed fiber. The mineral content ranges from 5 to 60 percent.

The bottom tier has hue of 10YR to 5Y, value of 2 to 4, and chroma of 0 to 3. The fiber content is 10 to 70 percent; the rubber fiber content is less than 40 percent. The mineral content ranges from 5 to 80 percent.

Manahawkin Series

The Manahawkin series consists of very deep, very poorly drained soils formed in organic deposits overlying sandy mineral material. Manahawkin soils are on broad depressions and in basinlike swamps and bogs that remain ponded for long periods. Slope is less than 1 percent.

Manahawkin soils are similar to Freetown, Ipswich, Mantunuck, and Pawcatuck soils. The Manahawkin soils are shallower to mineral material than the Freetown soils and are not subject to daily tidal flooding as are the Ipswich, Matunuck, and Pawcatuck soils.

Typical pedon of Manahawkin muck, in the Town of Oyster Bay, 200 feet west of Harbor Road and 1 mile south of NY Route 25A:

Oa1—0 to 7 inches; very dark gray (10YR 3/1) muck; 60 percent unrubbed herbaceous fiber; 15 percent rubbed; medium granular structure; very friable; mat of many fine roots; 50 percent silt; very strongly acid; abrupt smooth boundary.
Oa2—7 to 24 inches; black (5YR 2/1) broken face and rubbed muck; 20 percent unrubbed herbaceous fibers, 5 percent rubbed; massive; nonsticky; 40 percent silt and sand; very strongly acid; clear smooth boundary.
Oa3—24 to 28 inches; very dark gray (5YR 3/1) muck; 60 percent unrubbed herbaceous fiber, 10 percent rubbed; medium subangular blocky structure; nonsticky; 50 percent sand; strongly acid; clear smooth boundary.
Oe—28 to 36 inches; black (5YR 2/1) broken face and rubbed mucky peat; 60 percent unrubbed herbaceous fiber, 30 percent rubbed; massive; nonsticky; 25 percent sand; strongly acid; gradual smooth boundary.
C—36 to 60 inches; light brownish gray (10YR 6/2) sand; single grain; loose; 10 percent rock fragments; strongly acid.

The thickness of the organic layers ranges from 16 to 51 inches. The mineral content of organic layers ranges from 5 to 80 percent. The C horizon is up to 35 percent rock fragments. The soil is very strongly acid or strongly acid.

The surface tier is neutral or has hue of 10YR to 5YR, value of 2 or 3, and chroma of 0 or 1. This layer is typically sapric, but in some pedons it is hemic.

The organic part of the subsurface and bottom tiers is neutral or has hue of 5YR to 10YR, value of 2 or 3, chroma of 0 to 2. These layers are dominantly sapric, but some pedons contain layers of hemic material up to 10 inches thick.

The C horizon is neutral or has hue of 10YR, value of 2 to 6, and chroma of 0 to 2. It is sand or fine sand or their gravelly analogs.

Matunuck Series

The Matunuck series consists of very deep, very poorly drained soils that have a thin organic mantle overlying thick, sandy deposits. The soils are near the ocean in tidal marshes subject to tidal flooding twice daily. Slope is 0 to 1 percent.

Matunuck soils and Ipswich and Pawcatuck soils are on similar landscapes. The Matunuck soils have a thinner organic surface mantle than the Ipswich or Pawcatuck soils.

Typical pedon of Matunuck mucky peat in the Town of Oyster Bay, 800 feet west of the Tobay Beach parking lot and 800 feet north of Ocean Parkway:

Oe—0 to 8 inches; very dark gray (10YR 3/1) mucky peat; 60 percent unrubbed fiber, 20 percent rubbed; dense mat of roots, stems, and leaves; massive; friable; many fine medium and coarse roots; herbaceous fibers; 40 percent silt; slightly acid; abrupt smooth boundary.
C1—8 to 12 inches; gray (10YR 5/1) sand; single grain; loose; many fine and medium roots; 4 percent organic matter; neutral; abrupt smooth boundary.
C2—12 to 60 inches; light olive gray (5Y 6/2) sand; single grain; loose; 1 percent organic material; neutral.

The thickness of the organic layer and the depth to sand range from 8 to 16 inches. The soil ranges from strongly acid to mildly alkaline throughout.

The O horizon is neutral or has hue of 10YR to 5Y, value of 2 to 4, and chroma of 0 to 2. The unrubbed fiber content is 25 to 80 percent; the rubbed fiber content ranges from 15 to 50 percent. Organic matter content ranges from 20 to 75 percent.

The C horizon is neutral or has hue of 10YR to 5GY, value of 2 to 7, and chroma of 0 to 3. Organic matter content ranges from 1 to 10 percent. The C1 horizon ranges from fine sandy loam to coarse sand. The C2 horizon is loamy sand, sand, or coarse sand. Shell fragments and herbaceous fibers are in the C horizon of some pedons.

Mineola Series

The Mineola series consists of very deep, moderately well drained soils on outwash plains. The soils formed in a thin loamy mantle overlying stratified sand and gravel. Slope ranges from 0 to 3 percent.

Mineola soils are in a drainage sequence with well drained Hempstead soils and are near Sudbury and Atsion soils. The Mineola soils have a thick, dark surface layer that is not typical of the Sudbury or Atsion soils.

Typical pedon of Mineola sandy loam, in an area of Urban land-Mineola complex, in the town of Hempstead, 250 feet southwest of the intersection of Stewart and Merrick Avenues:

A1—0 to 3 inches; black (5YR 2/1) sandy loam; very dark gray (5YR 3/1) dry; moderate fine and medium granular structure; very friable; many fine roots; 5 percent fine gravel; moderately acid; abrupt smooth boundary.
A2—3 to 9 inches; dark reddish brown (5YR 2/2) sandy loam; dark reddish brown (5YR 3/2) dry; weak medium granular structure; very friable; common fine roots; 5 percent fine gravel; strongly acid; abrupt smooth boundary.
AB—9 to 11 inches; dark brown (7.5YR 3/2) sandy loam; weak coarse granular structure; friable; common fine roots; 10 percent fine gravel; moderately acid; clear smooth boundary.
2Bw—11 to 18 inches; brown (7.5YR 4/4) very gravelly loamy sand; weak fine granular structure; very friable; few fine roots; 55 percent fine gravel; moderately acid; abrupt wavy boundary.
3C1—18 to 21 inches; brownish yellow (10YR 6/6) sand; single grain; loose; 5 percent fine gravel; moderately acid; abrupt smooth boundary.
4C2—21 to 42 inches; yellowish brown (10YR 5/6) very gravelly sand; common medium faint strong brown (7.5YR 5/6) mottles; single grain; loose; 50 percent gravel; moderately acid; abrupt wavy boundary.
5C3—42 to 60 inches; very pale brown (10YR 7/4) sand; single grain; loose; 10 percent gravel; strongly acid.

The thickness of solum ranges from 15 to 30 inches and corresponds to the depth to stratified sand and gravel. The rock fragment content ranges from 0 to 30 percent in the A horizon and from 0 to 75 percent in individual layers in the B and C horizons. The rock fragments are mainly gravel of granitic origin, but the B and C horizons are up to 20 percent cobblestones. Reaction ranges from moderately acid to very strongly acid throughout.

The A horizon has hue of 10YR to 5YR, value of 2 or 3, and chroma of 1 or 2. It is loam, fine sandy loam, or sandy loam in the fine-earth fraction.

The AB horizon has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 2 or 3. It is loam, fine sandy loam, or sandy loam in the fine-earth fraction.

The Bw horizon has hue of 7.5YR to 2.5Y, value of 4 or 5, and chroma of 3 to 6. It is loamy sand or loamy fine sand in the fine-earth fraction.

The C horizon has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 4 to 6. It is loamy sand, sand, or coarse sand in the fine-earth fraction.

Montauk Series

The Montauk series consists of very deep, well drained soils on upland hills and ridges. These soils formed in loamy glacial till that is more compact than nearby glacial outwash deposits. Slope ranges from 0 to 25 percent.

Montauk soils are near Riverhead, Scio, and Wallington soils. The Montauk soils have a more firm and dense substratum than the Riverhead soils and are better drained than the Scio and Wallington soils.

Typical pedon of Montauk fine sandy loam, 3 to 8 percent slopes, in the Town of Oyster Bay, about 0.6 mile southwest of the intersection of NY Routes 25A and 106, in Muttontown Preserve:

Ap—0 to 7 inches; dark grayish brown (10YR 4/2) fine sandy loam; weak fine granular structure; very friable; many fine roots; 10 percent gravel; strongly acid; abrupt smooth boundary.
Bw1—7 to 19 inches; strong brown (7.5YR 5/6) fine sandy loam; weak fine subangular blocky structure; friable; common fine roots; 10 percent gravel; strongly acid; clear smooth boundary.
Bw2—19 to 28 inches; yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; few fine roots; 10 percent gravel; strongly acid; gradual smooth boundary.
Bw3—28 to 34 inches; light yellowish brown (10YR 6/4) sandy loam; weak coarse granular structure; very friable; 10 percent gravel; strongly acid; clear wavy boundary.
Cr1—34 to 47 inches; pale brown (10YR 6/3) loamy sand; few fine distinct reddish brown (5YR 5/4) mottles; weak thick platy structure; firm in place, friable when removed; 15 percent gravel; strongly acid; clear smooth boundary.
Cr2—47 to 60 inches; light yellowish brown (10YR 6/4) gravelly loamy sand; few fine faint brown (7.5YR 5/4) mottles; massive; firm, many pores; 20 percent gravel; strongly acid.

The thickness of the solum and the depth to the substratum range from 18 to 38 inches. The rock fragment content ranges from 3 to 15 percent in the A horizon, from 3 to 35 percent in the B horizon, and from 5 to 35 percent in the Cr horizon. The soil ranges from extremely acid to moderately acid throughout.

The A horizon has hue of 10YR or 7.5YR, value of 2 to 5, and chroma of 1 to 4. It is silt loam, loam, fine sandy loam, or sandy loam in the fine-earth portion.

The Bw horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 3 to 8. It is silt loam, loam, fine sandy loam, or sandy loam in the fine-earth fraction.

The C horizon has hue of 5YR to 5Y, value of 4 to 6, and chroma of 1 to 6. It is loamy sand or sandy loam in the fine-earth fraction. In most pedons few reddish brown or brown mottles or streaks are concentrated near gravel seams.

Pawcatuck Series

The Pawcatuck series consists of very deep, very poorly drained soils that formed in partially decomposed organic deposits derived from salt-tolerant herbaceous plants. Mineral soil layers underlie the organic deposit at a depth of 16 to 51 inches. These soils are in tidal marshes. Slope is less than 1 percent.

Pawcatuck soils and Ipswich and Matunuck soils are on similar landscapes. The organic deposits in the Pawcatuck soils are not as thick as those in the Ipswich soils, but they are thicker than those in the Matunuck soils. The Pawcatuck soils are subject to daily tidal saltwater flooding, while the similar Freetown and Manahawkin soils are in freshwater swampy areas not affected by saltwater tidal action.

Typical profile of Pawcatuck mucky peat, in the city of Glen Cove, adjacent to the west end of Dosoris Pond:

Oe1—0 to 8 inches; very dark grayish brown (10YR 3/2) mucky peat; 60 percent fiber, 40 percent rubbed; massive; friable; many roots; herbaceous fibers; 40 percent silt and fine sand; neutral; clear smooth boundary.
Oe2—8 to 12 inches; very dark gray (10YR 3/1) mucky peat; 40 percent fiber, 30 percent rubbed; massive; friable; many roots; 40 percent silt and fine sand; clear smooth boundary.
Oe3—12 to 22 inches; black (10YR 2/1) mucky peat; 40 percent fiber, 20 percent rubbed; massive; friable; common roots; 30 percent silt and fine sand; neutral; gradual smooth boundary.
Oe4—22 to 33 inches; black (10YR 2/1) mucky peat; 30 percent fiber, 16 percent rubbed; weak thin platy; slightly sticky; few roots; neutral; 30 percent fine sand; abrupt smooth boundary.
C—33 to 60 inches; dark gray (10YR 4/1) loamy sand; single grain; nonsticky; 5 percent gravel; neutral.

The thickness of the organic layers ranges from 16 to 51 inches and corresponds to the depth to the underlying sandy substratum. The rock fragment content ranges from 0 to 25 percent in the substratum. The soil ranges from strongly acid to mildly alkaline. Organic matter content ranges from 20 to 70 percent in the mucky peat.

The surface tier is neutral or has hue of 10YR to 5Y, value of 2 to 4, and chroma of 0 to 2.

The subsurface and bottom tiers are neutral or have hue of 10YR to 5Y, value of 2 to 5, and chroma of 0 to 3.

The C horizon is neutral or has hue of 10YR to 5Y, value of 2 to 7, and chroma of 0 to 3. It ranges mainly from loamy fine sand to sand in the fine-earth fraction, but some thin subhorizons are sandy loam. In some pedons shell fragments are common.

Plymouth Series

The Plymouth series consist of very deep, excessively drained soils that formed in sandy glacial outwash deposits. The Plymouth soils are on outwash plains and low morainic hills and ridges.

Plymouth soils are near Enfield, Riverhead, Sudbury, and Montauk soils. The Plymouth soils have a coarser textured subsoil than the Enfield or Riverhead soils. The Plymouth soils do not have the mottles that are typical of the Sudbury soils or the dense substratum that is typical of the Montauk soils.

Typical pedon of Plymouth loamy sand, in an area of Plymouth-Riverhead complex, 15 to 35 percent slopes, in

the town of Oyster Bay, 500 feet west of Harbor Road and 1 mile south of Route NY 25A:

Oi—2 inches to 0; black (5YR 2/1) partly decomposed leaves and twigs; many fine and medium roots; very strongly acid; abrupt smooth boundary.
A—0 to 5 inches; dark brown (7.5YR 3/2) loamy sand; weak fine granular structure; very friable; common fine and medium roots; 10 percent gravel; very strongly acid; clear wavy boundary.
Bw1—5 to 13 inches; strong brown (7.5YR 5/6) loamy sand; weak fine granular structure; very friable; few fine and medium roots; 5 percent gravel; very strongly acid; clear wavy boundary.
Bw2—13 to 26 inches; yellowish brown (10YR 5/6) loamy sand; weak fine granular structure; very friable; few fine roots; 3 percent gravel; strongly acid; gradual wavy boundary.
C1—26 to 42 inches; brownish yellow (10YR 6/6) gravelly sand; single grain; loose; 15 percent fine gravel; strongly acid; gradual smooth boundary.
C2—42 to 60 inches; pale yellow (2.5Y 7/4) gravelly coarse sand; single grain; loose; 15 percent fine gravel; strongly acid.

The solum thickness ranges from 20 to 36 inches. The content of rock fragments ranges from 2 to 25 percent in the solum and from 10 to 50 percent in the substratum. The soil is very strongly acid or strongly acid throughout.

The A horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 1 to 3. It is sand or loamy sand in the fine-earth fraction.

The B horizon has hue of 7.5YR or 10YR, value of 4 or 5, and chroma of 4 to 8. It is coarse sand to loamy fine sand in the fine-earth fraction.

The C horizon has hue of 10YR or 2.5Y, value of 5 to 7, chroma of 4 to 6. It is sand or coarse sand in the fine-earth fraction.

Riverhead Series

The Riverhead series consists of very deep, well drained soils that formed in glacial outwash deposits. The soils are on crests and side slopes of low morainic hills and on the tops and sides of outwash plains and terraces. Slope ranges from 0 to 35 percent.

Riverhead soils are in a drainage sequence with moderately well drained Sudbury soils and somewhat poorly drained and poorly drained Walpole soils and are similar to Plymouth, Enfield, and Montauk soils. The Riverhead soils are not as sandy as the Plymouth soils and do not have the high silt content typical of the Enfield soils or the dense substratum typical of the Montauk soils.

Typical pedon of Riverhead sandy loam, 3 to 8 percent slopes, in a wooded area in the town of Oyster Bay, 700 feet east of Round Swamp Road and 2,500 feet south of Old County Road:

Oi1—2 inches to 1 inch; litter of leaves and twigs.
Oi2—1 inch to 0; very dark brown (10YR 2/2) partly decomposed leaves and twigs; strongly acid; abrupt smooth boundary.
A—0 to 3 inches; brown (7.5YR 4/2) sandy loam; single grain; very friable; many fine and medium roots; 5 percent gravel; strongly acid; abrupt wavy boundary.
Bw1—3 to 8 inches; strong brown (7.5YR 5/6) fine sandy loam; weak fine subangular blocky structure; friable; common fine and medium roots; 5 percent gravel; strongly acid; clear smooth boundary.
Bw2—8 to 17 inches; yellowish brown (10YR 5/6) fine sandy loam; weak medium subangular blocky structure; friable; few fine and medium roots; 10 percent gravel; strongly acid; clear smooth boundary.
Bw3—17 to 24 inches; yellowish brown (10YR 5/6) sandy loam; weak coarse subangular blocky structure; very friable; few medium roots; 10 percent gravel; strongly acid; clear smooth boundary.
BC—24 to 35 inches; brownish yellow (10YR 6/6) loamy sand; massive; very friable; 5 percent gravel; strongly acid; abrupt wavy boundary.
2C1—35 to 52 inches; brownish yellow (10YR 6/6) sand; single grain; loose; 5 percent gravel; strongly acid; abrupt smooth boundary.
2C2—52 to 60 inches; brownish yellow (10YR 6/6) gravelly sand; weakly stratified; single grain; loose; 25 percent gravel; strongly acid.

The thickness of solum and the depth to sand and gravel range from 20 to 36 inches. The rock fragment content ranges from 0 to 10 percent in the surface layer, from 3 to 25 percent in the subsoil, and from 5 to 35 percent in the substratum. Reaction is strongly acid or very strongly acid throughout.

The A horizon has hue of 10YR or 7.5YR, value of 3 or 4, and chroma of 1 to 3. It is sandy loam, loam, or fine sandy loam.

The B horizon has hue of 7.5YR or 10YR, value of 4 to 6, and chroma of 4 to 6. It is fine sandy loam or sandy loam in the fine-earth fraction.

The BC horizon has hue of 7.5YR to 2.5Y, value of 4 to 6, and chroma of 4 to 6. It is loamy sand to fine sandy loam in the fine-earth fraction.

The C horizon has hue of 10YR or 2.5Y, value of 4 to 7, and chroma of 3 to 6. It is sand or coarse sand in the fine-earth fraction.

Scio Series

The Scio series consists of very deep, moderately well drained soils that formed in deposits with a large amount of silt or very fine sand. These soils are in basins that contained preglacial lakes. Slope ranges from 0 to 8 percent.

Scio soils are near Montauk, Enfield, and Wallington soils. The Scio soils have mottles in the lower part of the subsoil, and the Montauk and Enfield soils do not. The Scio soils are mottle-free in the upper part of the subsoil, but the Wallington soils have mottles in the upper part of the subsoil.

Typical pedon of Scio silt loam, in the town of Oyster Bay, west of Muttontown Preserve and 2,400 feet south of NY Route 25A:

Ap—0 to 12 inches; dark grayish brown (10YR 4/2) silt loam; moderate fine granular structure; very friable; many fine and medium roots; strongly acid; clear smooth boundary.

Bw1—12 to 17 inches; yellowish brown (10YR 5/4) silt loam; moderate fine subangular blocky structure; friable; common fine roots; strongly acid; clear wavy boundary.

Bw2—17 to 27 inches; brown (10YR 5/30 silt loam; few fine distinct reddish yellow (7.5YR 6/6) and light brownish gray (2.5Y 6/2) mottles; weak fine and medium subangular blocky structure; friable; few fine roots; 1 percent gravel; strongly acid; clear wavy boundary.

Bw3—27 to 35 inches; brown (10YR 5/3) silt loam; many medium distinct yellowish red (5YR 5/6) mottles and common medium distinct light gray (10YR 6/1) mottles; moderate medium subangular blocky structure; friable; few fine roots; strongly acid; abrupt wavy boundary.

C1—35 to 43 inches; light gray (5Y 6/1) silt loam; few medium prominent strong brown (7.5YR 5/6) mottles; massive; friable; strongly acid; abrupt wavy boundary.

C2—43 to 49 inches; brown (10YR 5/3) silt loam; few fine faint pale brown (10YR 6/3) mottles; weak thin platy structure; friable; 2 percent gravel; strongly acid; clear wavy boundary.

C3—49 to 60 inches; pale brown (10YR 6/3) silt loam; common medium prominent yellowish red (5YR 4/6) mottles; weak medium platy structure; friable; 2 percent gravel; strongly acid.

The solum thickness ranges from 20 to 36 inches. The depth of soil that has a texture that contrasts with that of the solum is more than 40 inches. The rock fragment content ranges from 0 to 5 percent above a depth of 40 inches and from 0 to 50 percent below a depth of 40 inches. Reaction in the surface layer, subsoil, and upper part of the substratum ranges from very strongly acid to moderately acid. In the lower part of the substratum reaction is strongly acid or moderately acid.

The A horizon has hue of 10YR or 7.5YR, value of 3 to 5, and chroma of 2 or 3. It is silt loam or very fine sandy loam.

The B horizon has hue of 10YR or 2.5Y, value of 4 or 5, and chroma of 3 to 6. It is mottled with high and low chroma between depths of 15 to 24 inches. It is silt loam or very fine sandy loam.

The C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 1 to 4. It is silt loam or very fine sandy loam.

Some pedons have a 2C horizon that ranges from very gravelly loamy sand to loam. It ranges from single grain in sandy layers to massive in layers of gravelly loam glacial till. The corresponding consistence ranges from loose to firm.

Sudbury Series

The Sudbury series consists of very deep, moderately well drained soils on outwash plains. The soils formed in a thin loamy mantle and underlying deposits of sand and gravel outwash. Slope ranges from 0 to 3 percent.

Sudbury soils are in a drainage sequence with well drained Riverhead soils and poorly drained or somewhat poorly drained Walpole soils, and are near Mineola and Scio soils. The Sudbury soils contain more sand than the Scio soils and do not have the thick, dark surface layer typical of the Mineola soils.

Typical pedon of Sudbury sand loam, in the town of Oyster Bay, about 0.2 mile east of Bethpage State Parkway and 0.3 mile north of the Southern State Parkway:

A—0 to 5 inches; dark brown (7.5YR 3/2) sandy loam; moderate fine granular structure; friable; many fine and medium roots; 3 percent gravel; very strongly acid; abrupt smooth boundary.

Bw—5 to 18 inches; yellowish brown (10YR 5/6) sandy loam; weak fine subangular blocky structure; friable; common fine roots; 5 percent gravel; very strongly acid; clear smooth boundary.

2BC—18 to 28 inches; yellowish brown (10YR 5/4) gravelly loamy sand; common medium distinct strong brown (7.5YR 5/6) mottles and faint grayish brown (10YR 5/2) mottles; weak medium subangular blocky structure; very friable; few roots; 20 percent gravel; very strongly acid; clear smooth boundary.

2C1—28 to 40 inches; pale brown (10YR 6/3) very gravelly sand; common threadlike yellowish red (5YR 4/6) mottles; massive; loose; 40 percent gravel; strongly acid; abrupt smooth boundary.

2C2—40 to 60 inches; very pale brown (10YR 7/3) very gravelly sand; weakly stratified; single grain; loose; 40 percent gravel; strongly acid.

The thickness of the solum and the depth to sand and gravel range from 18 to 30 inches. The depth to grayish and brownish mottles ranges from 12 to 24 inches. The rock fragment content of individual layers of the solum ranges from 0 to 30 percent, and in the substratum it ranges from 25 to 70 percent. The rock fragments are

mainly gravel of granitic origin and are up to 20 percent cobbles in the substratum. Reaction ranges from extremely acid to moderately acid throughout the soil.

The A horizon has hue of 7.5YR or 10YR, value of 3 or 4, and chroma of 2 to 4. It is fine sandy loam, very fine sandy loam, or sandy loam.

The B horizon has hue of 7.5YR or 10YR, value of 3 to 5, and chroma of 2 to 8. The upper part is sandy loam or fine sandy loam, and the lower part ranges from sandy loam to sand in the fine-earth fraction.

The 2C horizon has hue of 10YR or 2.5Y, value of 5 to 7, and chroma of 2 to 4. The fine-earth fraction is sand.

Udifluvents

Udifluvents consist of very deep, well drained and moderately well drained soils that formed in recent alluvium. They are on flood plains along larger drainage channels, most of which drain toward the north shore and into Long Island Sound. Slope ranges from 0 to 3 percent.

Udifluvents are near or adjacent to Enfield, Montauk, and Riverhead soils, all of which are on higher landscapes.

Because of the variability of the soil properties of Udifluvents, a typical pedon is not provided.

The content of rock fragments, mainly gravel fragments, ranges from 0 to 10 percent in the surface layer and subsoil and from 0 to 60 percent in the substratum. Reaction is very strongly acid or strongly acid throughout the soil.

The surface layer is 1 to 10 inches thick. It has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 3 or 4. It ranges from silt loam to sandy loam.

Some pedons have a subsoil that has hue of 7.5YR to 2.5Y, value of 3 to 5, and chroma of 3 or 4. Low and high chroma mottles are in some profiles. The fine-earth fraction is silt loam to sandy loam.

The substratum has hue of 7.5YR to 2.5Y, value of 4 to 7, and chroma of 2 to 6. It ranges from loam to sand in the fine-earth fraction.

Udipsamments

Udipsamments consist of very deep, excessively drained to moderately well drained, acid soils. The soils dominantly are loamy sand or sand and are commonly in areas of manmade cuts and fills, some of which contain dredged or pumped fill material. The soil material is mainly from sandy outwash deposits. Some areas are on barrier islands and plant-covered sand dunes. Slope ranges from 0 to 60 percent.

Udipsamments are near all of the other soils in the county.

Because Udipsamments have no profile development and in some areas have some nonsoil material incorporated into the profile, a typical pedon is not provided.

Udipsamments have a grayish brown or dark yellowish brown surface layer that is 1 to 9 inches thick. It is loamy sand or sand and contains 0 to 15 percent rock fragments.

The substratum has hue of 7.5YR to 5Y or is neutral, has value of 4 to 7, and has chroma of 0 to 8. It is loamy sand, sand, or organic material and contains 0 to 35 percent rock fragments. The rock fragments are mostly gravel fragments. In some profiles the substratum is mottled, especially in areas of fill dredged material over marsh vegetation. In these areas the underlying organic material is dark and is at a depth of more than 4 feet.

Udorthents

Udorthents consist of very deep, excessively drained, acid soils in areas of sanitary landfills. These soils consist of 20 to 40 inches of sand or loamy sand fill over layers of refuse or other buried waste material. Where filling operations are complete, the soils are covered by a loamy veneer to enhance the establishment of plants. Slope ranges from 0 to 35 percent.

Because of the variability of the soil material, a typical pedon is not provided.

The soil fill material is yellowish brown or pale brown loamy sand or sand. It is stratified in crude layers caused by grading to cover the refuse. Consistency is loose to firm, depending upon the amount of vehicle traffic over the area. A few gravel fragments are in some layers. The material below a depth of 20 to 40 inches is household or industrial refuse.

Wallington Series

The Wallington series consists of very deep, somewhat poorly drained soils formed in water-laid deposits that have a high content of silt and very fine sand. The soils are in basins in small lake plains. Slope ranges from 0 to 3 percent.

Wallington soils are near Walpole, Montauk, and Scio soils. The Wallington soils are not as sandy as the Walpole soils and are more poorly drained than the Montauk or Scio soils.

Typical pedon of Wallington silt loam, in the town of Oyster Bay, on the Muttontown Preserve, 1,500 feet south of the intersection of N.Y. Routes 25A and 106, 450 feet west of N.Y. Route 106:

Ap—0 to 13 inches; very dark grayish brown (10YR 3/2) silt loam; weak fine and medium granular structure; very friable; common fine and medium roots and few coarse roots; very strongly acid; clear wavy boundary.

E1—13 to 18 inches; pale brown (10YR 6/3) silt loam; few fine distinct brownish yellow (10YR 6/8) mottles; weak fine subangular blocky structure; very friable;

few fine and medium roots; very strongly acid; clear smooth boundary.
E2—18 to 24 inches; light brownish gray (2.5Y 6/2) silt loam; many coarse faint pale brown (10YR 6/3) mottles and common medium distinct brownish yellow (10YR 6/8) mottles; moderate medium subangular blocky structure; friable; very strongly acid; abrupt wavy boundary.
Bx1—24 to 35 inches; pale brown (10YR 6/3) silt loam; many medium distinct light gray (10YR 7/1) mottles and many medium prominent strong brown (7.5YR 5/8) mottles; weak very coarse prismatic structure parting to weak thick platy; firm; brittle; faces of prisms are light brownish gray (2.5Y 6/2); few medium pores, some with clay linings; strongly acid; clear wavy boundary.
Bx2—35 to 42 inches; light yellowish brown (10YR 6/4) very fine sandy loam; common medium faint light brownish gray (10YR 6/2) mottles and common medium distinct strong brown (7.5YR 5/8) mottles; very weak very coarse prismatic structure parting to very thick platy; firm, brittle; few pores with clay linings; strongly acid; clear smooth boundary.
C—42 to 60 inches; light yellowish brown (10YR 6/4) stratified silt loam and very fine sand; common medium faint light brownish gray (10YR 6/2) mottles and common medium distinct strong brown (7.5YR 5/8) mottles; massive; friable; moderately acid.

The solum thickness ranges from 36 to 50 inches. The volume of rock fragments is less than 5 percent in the solum and ranges from 0 to 10 percent in the substratum. Reaction in the solum is very strongly acid or strongly acid, and in the substratum it is moderately acid to slightly acid.

The Ap horizon has hue of 10YR, value of 3 or 4, and chroma of 2 or 3. It is silt loam or very fine sandy loam.

The E horizon has hue of 10YR or 2.5Y, value of 5 or 6, and chroma of 2 or 3. It is silt loam or very fine sandy loam.

The Bx horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 2 to 4. The structure is very coarse prismatic that parts to platy, or it is massive within prisms. The texture is silt loam or very fine sandy loam. Consistency is firm or very firm.

The C horizon is similar in color to the Bx horizon. The C horizon is silt loam or very fine sandy loam. It is massive or has platy structure.

Walpole Series

The Walpole series consists of very deep, poorly drained and somewhat poorly drained soils on low outwash plains. These soils formed in a thin loamy mantle overlying water-deposited layers of sand and gravel. Slope ranges from 0 to 2 percent.

The Walpole soils are in a drainage sequence with well drained Riverhead soils and moderately well drained Sudbury soils and in many places are near Wallington soils. The Walpole soils are more sandy than the Wallington soils.

Typical pedon of Walpole sandy loam, in the town of Oyster Bay, 600 feet north of N.Y. Route 25A, across the highway from the entrance to the NY Institute of Technology:

Oe—1 inch to 0; partially decomposed leaf mat.
A—0 to 8 inches; very dark grayish brown (10YR 3/2) sandy loam; weak medium granular structure; very friable; many fine roots; 5 percent gravel; very strongly acid; clear wavy boundary.
Bw—8 to 18 inches; brown (10YR 5/3) sandy loam; common medium distinct strong brown (7.5YR 5/6) and light brown gray (10YR 6/2) mottles; weak medium subangular blocky structure; very friable; few fine roots; 10 percent gravel; strongly acid; clear smooth boundary.
BC—18 to 28 inches; light brownish gray (10YR 6/2) loamy sand; common medium distinct yellowish brown (10YR 5/6) mottles; weak coarse subangular blocky structure; very friable; few fine roots; 10 percent gravel; strongly acid; clear smooth boundary.
C1—28 to 36 inches; light brownish gray (2.5Y 6/2) loamy sand; common medium distinct strong brown (7.5YR 5/6) mottles; single grain; loose; 5 percent gravel; strongly acid; abrupt smooth boundary.
2C2—36 to 60 inches; light brownish gray (2.5Y 6/2) very gravelly loamy sand; many medium faint light yellowish brown (2.5Y 6/4) mottles; single grain; loose, nonsticky; 40 percent gravel; strongly acid.

The thickness of the solum ranges from 18 to 28 inches. The rock fragment content, by volume, ranges from 0 to 10 percent in the surface layer, from 0 to 30 percent in the subsoil, and from 0 to 50 percent in the substratum. The soil ranges from very strongly acid to moderately acid.

The A horizon has hue of 10YR, value of 2 or 3, and chroma of 1 or 2. It is fine sandy loam or sandy loam.

The B horizon has hue of 10YR or 2.5Y, value of 4 to 6, and chroma of 1 to 3. It is sandy loam or fine sandy loam in the fine-earth fraction.

The C horizon has hue of 10YR to 5Y, value of 4 to 6, and chroma of 2 or 3. It is sand or loamy sand in the fine-earth fraction. Gravelly or very gravelly analogs are common.

Formation of the Soils

The first part of this section describes the factors of soil formation and relates them to the formation of the soils in the survey area. The second part defines the processes of soil horizon development as they relate to soil formation in Nassau County.

Factors of Soil Formation

Soils are the products of weathering and other processes that act on parent material. The properties of the soil at any point on the earth depend on the combined effects of five major factors: the physical and chemical composition of the parent material, climate, plant and animal life, relief, and time. The relative influence of each of these factors on soil formation differs from place to place, and each modifies the effect of the other four. For example, the effects of climate and plant and animal life are influenced by relief and by the nature of the parent material. In places the influence of one factor is dominant.

Parent Material

Parent material is the unconsolidated earthy mass in which soils form. It determines the mineral composition and contributes greatly to the chemical composition of the soil. It also influences the rate of the soil-forming processes.

Most of the soils of Nassau County formed in three main mineral materials which were deposited by glaciation: (1) glacial till consisting of unsorted ice-contact sediments; (2) glacial outwash consisting of sorted sand and gravel; and (3) glacial lake-laid silt, clay, and very fine sand. Glacial lake sediments constitute a very small part of the sedimentary parent material of the county. The mineral materials were derived mainly from granite and are largely quartz sand.

As the glacier moved to what is now Nassau County, it carried large amounts of rock, much of which was ground into gravel, sand, and silt and a small amount of clay. A part of this material was deposited directly by the glacier in a compact, heterogenous mass called glacial till. Montauk soils and the till substratum Scio soils formed in these areas. The Scio soils have a mantle of silty glacial lake sediment on the till.

As the glacial ice melted, enormous quantities of meltwater carried and sorted soil and rock debris. This outwash material was redeposited in layers of sand and gravel on moraines and outwash plains. Examples of soils formed in this material are Plymouth and Riverhead soils.

When further melting and retreating of the ice front took place, a considerable part of the exposed landscape was covered by lake-laid or wind-deposited silt-size particles. Scio and Wallington soils formed in low pockets of mostly lake-laid silt, and Enfield and Hempstead soils formed in eolian silt deposited on outwash plains.

When the glacier continued to melt, the meltwater dissected and gullied into the outwash deposits. In some of these channels, recently deposited alluvial sediments form a mantle over sand and gravel. Udifluvents form in these channels. Some of the channels have very little recent deposition, and many are wet because of the water table is near the surface. Atsion and Berryland are examples of soils formed in these areas.

In addition to glacial deposits, beaches and dunes have formed along the shorelines in more recent times through the action of waves and wind.

The parent material of low wet areas, or bogs, is organic deposits. Where the bogs are in freshwater, they are Freetown soils. Those in tidal areas are Ipswich soils.

In many areas, construction activities have exposed relatively fresh parent material. Most of these areas are very sandy and are Udipsamments.

Relief

The slope and shape of the land surface determine to a large extent the amount of water that enters and passes through the soil and the depth to the water table.

The amount of water that is on, in, or moving through a soil affects oxidation, bacterial action, weathering, and the rate of removal of the minerals within the soil. The translocation of salts, fine clay, and other soil components is most noticeable in permeable soil material through which water can move readily. The soils in some low-lying areas are waterlogged, or they have a water table nearer to the surface than do the soils on adjacent higher areas. The surface layer of wet soils is darker than that of well drained soils because the oxidation of organic matter is retarded in wet areas and the organic matter tends to accumulate. The subsoil of wet soils is gray or mottled because of the reduction of minerals, and the subsoil of well drained soils on higher

areas is brown or yellowish brown because of the oxidation of minerals.

Local differences in soils are largely the result of differences in parent material and topography. Table 18 shows the relationship of the soils in the county to landscape position, parent material, and drainage.

Climate

Nassau County has a humid, temperate climate that is strongly influenced by Long Island Sound and the Atlantic Ocean. Detailed climatic data for the county are given in the section "General Nature of the County." Climate affects soil formation through its influence on chemical, physical, and biological processes. Water passing through the soil alters the chemical composition, and changes in temperature affect the rates of chemical changes and biological activity. Freezing and thawing affect the physical weathering of rocks and soil material. Decomposition of organic matter increases as the average annual soil temperature increases. The climate throughout Nassau County is fairly uniform; therefore, differences in soils in the county are not directly attributable to differences in climate.

Plant and Animal Life

All living organisms, including man, affect soil formation. The kind and amount of vegetation generally determine the amount of organic matter and nutrients in the soil and the color and structure of the surface layer. Earthworms and burrowing animals help to keep the soil porous and permeable to air and water. The waste products of animals cause aggregations of soil particles and improve soil structure. Bacteria and fungi decompose vegetation, thus releasing nutrients for plant use.

The native vegetation in most of Nassau County was originally hardwoods of oak, beech, and maple mixed with varying proportions of pine. An area across the center of the county was in a cover of grass that significantly affected the appearance and formation of the Hempstead and Mineola soils that formed in that area. Wet areas have a component of alders, cattails, or sedges. Tidal marshes have saltwater sedges.

Grasses and hardwoods retard leaching and the subsequent loss of nutrients. Grasses and hardwoods take up large quantities of bases or nutrients and return many of these elements, in the form of grass and leaf litter, to the soil surface each year. In contrast, pines and other conifers do not use the leaching process as well as hardwoods do.

Man's activities have brought about significant changes in many of the soils of the county. Tillage has accelerated erosion on sloping soils and has resulted in a mixing of the natural surface layer and the upper part of the subsoil, developing a new surface layer 10 to 12 inches thick. In this layer, the microbiology of the soil has changed through the use of lime, fertilizer, and pesticides. The activities of man have resulted in extensive changes in the upper part of the soil where excavations and fills have been made for development and construction.

Time

The geologic age of the soils of Nassau County is young. The last glacier receded from the county about 11,000 years ago, and most of the soil-forming processes have taken place during that time.

Most of the soils in glacial deposits are moderately well developed, especially in the upper layers. Soils in bogs and on dunes lack strongly distinguishing profile characteristics, however, because the soils are of recent origin.

Processes of Soil Formation

The soil-forming factors and the subsequent processes of soil formation result in the formation of different layers, or soil horizons. These horizons make up the soil profile, which extends from the surface downward into material that is seldom altered by soil-forming processes. Most soils contain three major horizons, the A, B, and C horizons (*9*). The C horizon is generally considered the parent material and has undergone little alteration by the soil-forming factors.

Several processes are involved in the formation of soil horizons: the accumulation of organic matter, leaching of soluble salts and minerals, translocation of silicate clay minerals, reduction and transfer of iron, and formation of compact layers in the subsoil.

Organic matter accumulates as plant residue decomposes. This process darkens the surface layer and helps to form the A horizon. Normally, the wetter the soil is, the more organic matter it has in the surface layer. Depending on the organic matter content, the color of the layer ranges from dark brown in most of the drier soils, such as Enfield soils, to black in very poorly drained soils, for example, Berryland soils. Well drained Hempstead soils and moderately well drained Mineola soils have a dark surface layer because they developed under grasses rather than in a saturated wet site.

For the development of distinct subsoil horizons, or B horizons, some or most of the soluble salts must be leached so that other processes, such as the accumulation of secondary iron compounds, can take place. The factors that affect leaching are the kinds of salts originally in the soil, the rate and depth of percolation, and the texture of the soil.

Most of the well drained and moderately well drained soils in the county are strong brown or yellowish brown in the subsoil. These colors are mainly caused by thin coatings of iron oxides on sand and silt particles. A bright-colored subsoil with iron oxide coatings normally has developed subangular blocky structure but contains

little or no translocated clay. Enfield and Riverhead are examples of soils that have a bright-colored subsoil.

Reduction and transfer of iron compounds occur mainly in the wetter soils, in which there is an alternating pattern of gray and brown that is called mottling. Poorly drained Atsion and Walpole soils, for instance, have this distinct pattern of mottling in the subsoil.

Some of the soils in Nassau County have a distinct fragipan, while others have a substratum that is not a fragipan but is relatively firm and dense. The Wallington soils have a brittle fragipan, and the Montauk soils have dense glacial till in the substratum. In both instances, these layers are firm and dense; however, this layer is slightly more porous in the Montauk soils. The genesis of a fragipan and a dense substratum is not fully understood, but both are less permeable than is the substratum in most other soils in the county.

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Glossary

ABC soil. A soil having an A, a B, and a C horizon.

Ablation till. Loose, permeable till deposited during the final downwasting of glacial ice. Lenses of crudely sorted sand and gravel are common.

AC soil. A soil having only an A and a C horizon. Commonly such soil formed in recent alluvium or on steep rocky slopes.

Aeration, soil. The exchange of air in soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil. Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil. A soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvium. Material, such as sand, silt, or clay, deposited on land by streams.

Area reclaim (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	Inches
Very low	0 to 2.4
Low	2.4 to 3.2
Moderate	3.2 to 5.2
High	more than 5.2

Basal till. Compact glacial till deposited beneath the ice.

Base saturation. The degree to which material having cation exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation exchange capacity.

Bedding planes. Fine stratifications, less than 5 millimeters thick, in unconsolidated alluvial, eolian, lacustrine, or marine sediments.

Bedding system. A drainage system made by plowing, grading, or otherwise shaping the surface of a flat field. It consists of a series of low ridges separated by shallow, parallel dead furrows.

Bedrock. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

Bench terrace. A raised, level or nearly level strip of earth constructed on or nearly on the contour, supported by a barrier of rocks or similar material, and designed to make the soil suitable for tillage and to prevent accelerated erosion.

Bisequum. Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

Blowout. A shallow depression from which all or most of the soil material has been removed by wind. A blowout has a flat or irregular floor formed by a resistant layer or by an accumulation of pebbles or cobbles. In some blowouts the water table is exposed.

Bottom land. The normal flood plain of a stream, subject to flooding.

Boulders. Rock fragments larger than 2 feet (60 centimeters) in diameter.

Broad-base terrace. A ridge-type terrace built to control erosion by diverting runoff along the contour at a nonscouring velocity. The terrace is 10 to 20 inches high and 15 to 30 feet wide and has gently sloping sides, a rounded crown, and a dish-shaped channel along the upper side. It may be nearly level or have a grade toward one or both ends.

Calcareous soil. A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

Caliche. A more or less cemented deposit of calcium carbonate in soils of warm-temperate, subhumid to arid areas. Caliche occurs as soft, thin layers in the soil or as hard, thick beds just beneath the solum, or it is exposed at the surface by erosion.

California bearing ratio (CBR). The load-supporting capacity of a soil as compared to that of a standard crushed limestone, expressed as a ratio. First standardized in California. A soil having a CBR of 16 supports 16 percent of the load that would be supported by standard crushed limestone, per unit area, with the same degree of distortion.

Capillary water. Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Catena. A sequence, or "chain," of soils on a landscape that formed in similar kinds of parent material but have different characteristics as a result of differences in relief and drainage.

Cation. An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity. The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

Catsteps. Very small, irregular terraces on steep hillsides, especially in pasture, formed by the trampling of cattle or the slippage of saturated soil.

Cement rock. Shaly limestone used in the manufacture of cement.

Channery soil. A soil that is, by volume, more than 15 percent thin, flat fragments of sandstone, shale, slate, limestone, or schist as much as 6 inches along the longest axis. A single piece is called a channer.

Chiseling. Tillage with an implement having one or more soil-penetrating points that shatter or loosen hard compacted layers to a depth below normal plow depth.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film. A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Claypan. A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax vegetation. The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

Coarse fragments. If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15 to 38 centimeters (6 to 15 inches) long.

Coarse textured soil. Sand or loamy sand.

Cobblestone (or cobble). A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

Colluvium. Soil material, rock fragments, or both moved by creep, slide, or local wash and deposited at the base of steep slopes.

Complex slope. Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil. A map unit of two or more kinds of soil in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils are somewhat similar in all areas.

Compressible (in tables). Excessive decrease in volume of soft soil under load.

Conservation Tillage. Any tillage and planting system that keeps at least 30 percent of the soil surface covered by residue after planting to reduce soil erosion by water; or where soil erosion by wind is the primary concern, maintains at least 1,000 pounds of flat small grain residue equivalent on the surface during the critical erosion period.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

Congelturbate. Soil material disturbed by frost action.

Conservation tillage. A tillage and planting system in which crop residue covers at least 30 percent of the soil surface after planting. Where soil erosion by wind is the main concern, the system leaves the equivalent of at least 1,000 pounds per acre of flat small-grain residue on the surface during the critical erosion period.

Consistence, soil. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are—

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.
Soft.—When dry, breaks into powder or individual grains under very slight pressure.
Cemented.—Hard; little affected by moistening.

Contour stripcropping. Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

Control section. The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 or 80 inches.

Coprogenous earth (sedimentary peat). Fecal material deposited in water by aquatic organisms.

Corrosive. High risk of corrosion to uncoated steel or deterioration of concrete.

Cover crop. A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

Cutbanks cave (in tables). The walls of excavations tend to cave in or slough.

Decreasers. The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing. Postponing grazing or resting grazing land for a prescribed period.

Dense layer (in tables). A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compacting.

Depth to rock (in tables). Bedrock is too near the surface for the specified use.

Diversion (or diversion terrace). A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

Drainage class (natural). Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, as opposed to altered drainage, which is commonly the result of artificial drainage or irrigation but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven classes of natural soil drainage are recognized:
Excessively drained.—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.
Somewhat excessively drained.—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.
Well drained.—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.
Moderately well drained.—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.
Somewhat poorly drained.—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.
Poorly drained.—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.
Very poorly drained.—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

Drainage, surface. Runoff, or surface flow of water, from an area.

Drumlin. A low, smooth, elongated oval hill, mound, or ridge of compact glacial till. The longer axis is parallel to the path of the glacier and commonly has a blunt nose pointing in the direction from which the ice approached.

Eluviation. The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material

through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material. Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Erosion. The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.
Erosion (geologic). Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.
Erosion (accelerated). Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature, for example, fire, that exposes the surface.

Erosion pavement. A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Esker (geology). A narrow, winding ridge of stratified gravelly and sandy drift deposited by a stream flowing in a tunnel beneath a glacier.

Excess alkali (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

Excess fines (in tables). Excess silt and clay in the soil. The soil is not a source of gravel or sand for construction purposes.

Excess lime (in tables). Excess carbonates in the soil that restrict the growth of some plants.

Excess salts (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

Excess sulfur (in tables). Excessive amount of sulfur in the soil. The sulfur causes extreme acidity if the soil is drained, and the growth of most plants is restricted.

Fallow. Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grains are grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

Fast intake (in tables). The rapid movement of water into the soil.

Fertility, soil. The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat). The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called *normal field capacity, normal moisture capacity,* or *capillary capacity.*

Fine textured soil. Sandy clay, silty clay, and clay.

First bottom. The normal flood plain of a stream, subject to frequent or occasional flooding.

Flagstone. A thin fragment of sandstone, limestone, slate, shale, or (rarely) schist, 6 to 15 inches (15 to 38 centimeters) long.

Flood plain. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

Foot slope. The inclined surface at the base of a hill.

Forb. Any herbaceous plant not a grass or a sedge.

Fragile (in tables). A soil that is easily damaged by use or disturbance.

Fragipan. A loamy, brittle subsurface horizon low in porosity and content of organic matter and low or moderate in clay but high in silt or very fine sand. A fragipan appears cemented and restricts roots. When dry, it is hard or very hard and has a higher bulk density than the horizon or horizons above. When moist, it tends to rupture suddenly under pressure rather than to deform slowly.

Frost action (in tables). Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Gilgai. Commonly a succession of microbasins and microknolls in nearly level areas or of microvalleys and microridges parallel with the slope. Typically, the microrelief of Vertisols—clayey soils having a high coefficient of expansion and contraction with changes in moisture content.

Glacial drift (geology). Pulverized and other rock material transported by glacial ice and then deposited. Also the sorted and unsorted material deposited by streams flowing from glaciers.

Glacial outwash (geology). Gravel, sand, and silt, commonly stratified, deposited by glacial melt water.

Glacial till (geology). Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Glaciofluvial deposits (geology). Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

Glaciolacustrine deposits. Material ranging from fine clay to sand derived from glaciers and deposited in glacial lakes mainly by glacial melt water. Many deposits are interbedded or laminated.

Gleyed soil. Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Graded stripcropping. Growing crops in strips that grade toward a protected waterway.

Grassed waterway. A natural or constructed waterway, typically broad and shallow, seeded to grass as protection against erosion. Conducts surface water away from cropland.

Gravel. Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Gravelly soil material. Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.6 centimeters) in diameter.

Green manure crop (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

Ground water (geology). Water filling all the unblocked pores of underlying material below the water table.

Gully. A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Hemic soil material (mucky peat). Organic soil material intermediate in degree of decomposition between the less decomposed fibric and the more decomposed sapric material.

Horizon, soil. A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an uppercase letter represents the major horizons. Numbers or lowercase letters that follow represent subdivisions of the major horizons. The major horizons are as follows:

O horizon.—An organic layer of fresh and decaying plant residue.

A horizon.—The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, any plowed or disturbed surface layer.

E horizon.—The mineral horizon in which the main feature is loss of silicate clay, iron, aluminum, or some combination of these.

B horizon.—The mineral horizon below an O, A, or E horizon. The B horizon is in part a layer of transition from the overlying horizon to the underlying C horizon. The B horizon also has distinctive characteristics, such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) granular, prismatic, or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon.—The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying horizon. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, an Arabic numeral, commonly a 2, precedes the letter C.

Cr horizon.—Soft, consolidated bedrock beneath the soil.

R layer.—Hard, consolidated bedrock beneath the soil. The bedrock commonly underlies a C horizon but can be directly below an A or a B horizon.

Humus. The well decomposed, more or less stable part of the organic matter in mineral soils.

Hydrologic soil groups. Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

Illuviation. The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers. Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as

contrasted with percolation, which is movement of water through soil layers or material.

Infiltration capacity. The maximum rate at which water can infiltrate into a soil under a given set of conditions.

Infiltration rate. The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches per hour. The rate can be limited by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intake rate. The average rate of water entering the soil under irrigation. Most soils have a fast initial rate; the rate decreases with application time. Therefore, intake rate for design purposes is not a constant but is a variable depending on the net irrigation application. The rate of water intake in inches per hour is expressed as follows:

Less than 0.2	very low
0.2 to 0.4	low
0.4 to 0.75	moderately low
0.75 to 1.25	moderate
1.25 to 1.75	moderately high
1.75 to 2.5	high
More than 2.5	very high

Invaders. On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, invader plants follow disturbance of the surface.

Irrigation. Application of water to soils to assist in production of crops. Methods of irrigation are—

Border.—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders.

Basin.—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

Controlled flooding.—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

Corrugation.—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

Drip (or trickle).—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

Furrow.—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

Sprinkler.—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

Subirrigation.—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

Wild flooding.—Water, released at high points, is allowed to flow onto an area without controlled distribution.

Kame (geology). An irregular, short ridge or hill of stratified glacial drift.

Karst (topography). The relief of an area underlain by limestone that dissolves in differing degrees, thus forming numerous depressions or small basins.

Lacustrine deposit (geology). Material deposited in lake water and exposed when the water level is lowered or the elevation of the land is raised.

Landslide. The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Large stones (in tables). Rock fragments 3 inches (7.6 centimeters) or more across. Large stones adversely affect the specified use of the soil.

Leaching. The removal of soluble material from soil or other material by percolating water.

Liquid limit. The moisture content at which the soil passes from a plastic to a liquid state.

Loam. Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Loess. Fine grained material, dominantly of silt-sized particles, deposited by wind.

Low strength. The soil is not strong enough to support loads.

Medium textured soil. Very fine sandy loam, loam, silt loam, or silt.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil. Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Minimum tillage. Only the tillage essential to crop production and prevention of soil damage.

Miscellaneous area. An area that has little or no natural soil and supports little or no vegetation.

Moderately coarse textured soil. Coarse sandy loam, sandy loam, and fine sandy loam.

Moderately fine textured soil. Clay loam, sandy clay loam, and silty clay loam.

Moraine (geology). An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil. The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil. Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance—*few, common,* and

many; size—*fine, medium,* and *coarse*; and contrast—*faint, distinct,* and *prominent*. The size measurements are of the diameter along the greatest dimension. *Fine* indicates less than 5 millimeters (about 0.2 inch); *medium*, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and *coarse*, more than 15 millimeters (about 0.6 inch).

Muck. Dark colored, finely divided, well decomposed organic soil material. (See Sapric soil material.)

Munsell notation. A designation of color by degrees of the three simple variables—hue, value, and chroma. For example, a notation of 10YR 6/4 is a color of 10YR hue, value of 6, and chroma of 4.

Narrow-base terrace. A terrace no more than 4 to 8 feet wide at the base. A narrow-base terrace is similar to a broad-base terrace, except for the width of the ridge and channel.

Neutral soil. A soil having a pH value between 6.6 and 7.3. (See Reaction, soil.)

Nutrient, plant. Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Organic matter. Plant and animal residue in the soil in various stages of decomposition.

Outwash, glacial. Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by glacial melt water.

Outwash plain. A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.

Pan. A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, *hardpan, fragipan, claypan, plowpan,* and *traffic pan*.

Parent material. The unconsolidated organic and mineral material in which soil forms.

Peat. Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material).

Ped. An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon. The smallest volume that can be called "a soil." A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 10 square meters), depending on the variability of the soil.

Percolation. The downward movement of water through the soil.

Percs slowly (in tables). The slow movement of water through the soil adversely affecting the specified use.

Permafrost. Layers of soil, or even bedrock, occurring in arctic or subarctic regions, in which a temperture below freezing has existed continuously for a long time.

Permeability. The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil. Terms describing permeability are:

Very slow	less than 0.06 inch
Slow	0.06 to 0.2 inch
Moderately slow	0.2 to 0.6 inch
Moderate	0.6 inch to 2.0 inches
Moderately rapid	2.0 to 6.0 inches
Rapid	6.0 to 20 inches
Very rapid	more than 20 inches

Phase, soil. A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value. A numerical designation of acidity and alkalinity in soil. (See Reaction, soil.)

Piping (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.

Pitting (in tables). Pits caused by melting ground ice. They form on the soil after plant cover is removed.

Plasticity index. The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit. The moisture content at which a soil changes from semisolid to plastic.

Plinthite. The sesquioxide-rich, humus-poor, highly weathered mixture of clay with quartz and other diluents. It commonly appears as red mottles, usually in platy, polygonal, or reticulate patterns. Plinthite changes irreversibly to an ironstone hardpan or to irregular aggregates on repeated wetting and drying, especially if it is exposed also to heat from the sun. In a moist soil, plinthite can be cut with a spade. It is a form of laterite.

Plowpan. A compacted layer formed in the soil directly below the plowed layer.

Ponding. Standing water on soils in closed depressions. Unless the soils are artificially drained, the water can be removed only by percolation or evapotranspiration.

Poorly graded. Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.

Poor filter (in tables). Because of rapid permeability the soil may not adequately filter effluent from a waste disposal system.

Poor outlets (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.

Productivity, soil. The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil. A vertical section of the soil extending through all its horizons and into the parent material.

Rangeland. Land on which the potential natural vegetation is predominantly grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range condition. The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor, on the basis of how much the present plant community has departed from the potential.

Range site. An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil. A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as—

	pH
Extremely acid	below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Moderately acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and higher

Regolith. The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.

Relief. The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material). Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill. A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rippable. Bedrock or hardpan can be excavated using a single-tooth ripping attachment mounted on a tractor with a 200-300 draw bar horsepower rating.

Rock fragments. Rock or mineral fragments having a diameter of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Rooting depth (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

Root zone. The part of the soil that can be penetrated by plant roots.

Runoff. The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called ground-water runoff or seepage flow from ground water.

Saline soil. A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

Salty water (in tables.) Water that is too salty for consumption by livestock.

Sand. As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sandstone. Sedimentary rock containing dominantly sand-size particles.

Sapric soil material (muck). The most highly decomposed of all organic soil material. Much has the least amount of plant fiber, the highest bulk density, and the lowest water content at saturation of all organic soil material.

Saprolite (soil science). Unconsolidated residual material underlying the soil and grading to hard bedrock below.

Sedimentary rock. Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

Seepage (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

Sequum. A sequence consisting of an illuvial horizon and the overlying eluvial horizon. (See Eluviation.)

Series, soil. A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Shale. Sedimentary rock formed by the hardening of a clay deposit.

Sheet erosion. The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and surface runoff.

Shrink-swell. The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica. A combination of silicon and oxygen. The mineral form is called quartz.

Silica-sesquioxide ratio. The ratio of the number of molecules of silica to the number of molecules of alumina and iron oxide. The more highly weathered soils or their clay fractions in warm-temperate, humid regions, and especially those in the tropics, generally have a low ratio.

Silt. As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Siltstone. Sedimentary rock made up of dominantly silt-sized particles.

Sinkhole. A depression in the landscape where limestone has been dissolved.

Site index. A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75 feet.

Slickensides. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, whre there is marked change in moisture content.

Slick spot. A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil is generally silty or clayey, is slippery when wet, and is low in productivity.

Slippage (in tables). Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope. The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multipled by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Slope (in tables). Slope is great enough that special practices are required to ensure satisfactory performance of the soil for a specific use.

Sloughed till. Water-saturated till that has flowed slowly downhill from its original place of deposit by glacial ice. It may rest on other till, on glacial outwash, or on a glaciolacustrine deposit.

Slow intake (in tables). The slow movement of water into the soil.

Slow refill (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

Small stones (in tables). Rock fragments less than 3 inches (7.6 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

Sodicity. The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium adsorption ratio (SAR) of a saturation extract, or the ratio of Na^+ to $Ca^{++} + Mg^{++}$. The degrees of sodicity are—

	SAR
Slight	less than 13:1
Moderate	13-30:1
Strong	more than 30:1

Soil. A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

Soil separates. Mineral particles less than 2 millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	Millimeters
Very coarse sand	2.0 to 1.0
Coarse sand	1.0 to 0.5
Medium sand	0.5 to 0.25
Fine sand	0.25 to 0.10
Very fine sand	0.10 to 0.05
Silt	0.05 to 0.002
Clay	less than 0.002

Solum. The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of the A, E, and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and plant and animal activities are largely confined to the solum.

Stone line. A concentration of coarse fragments in a soil. Generally it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

Stones. Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

Stony. Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Stripcropping. Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.

Structure, soil. The arrangement of primary soil particles into compound particles or aggregates. The principal forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular. Structureless* soils are either *single grained* (each grain by itself, as in dune sand) or *massive* (the particles adhering without any regular cleavage, as in many hardpans).

Stubble mulch. Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period the the new crop.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Subsoiling. Breaking up a compact subsoil by pulling a special chisel through the soil.

Substratum. The part of the soil below the solum.

Subsurface layer. Any surface soil horizon (A, E, AB, or EB) below the surface layer.

Summer fallow. The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

Surface layer. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, ranging in depth from about 4 to 10 inches (10 to 25 centimeters). Frequently designated as the "plow layer," or the "Ap horizon."

Surface soil. The A, E, AB, and EB horizons. It includes all subdivisions of these horizons.

Taxadjuncts. Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

Terminal moraine. A belt of thick glacial drift that generally marks the termination of important glacial advances.

Terrace. An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet.

Terrace (geologic). An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are *sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay,* and *clay*. The sand, loamy sand, and sandy loam classes may be further divided by specifiying "coarse," "fine," or "very fine."

Thin layer (in tables). Otherwise suitable soil material too thin for the specified use.

Till plain. An extensive flat to undulating area underlain by glacial till.

Tilth, soil. The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope. The outermost inclined surface at the base of a hill; part of a foot slope.

Too arid (in tables). The soil is dry most of the time, and vegetation is difficult to establish.

Topsoil. The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Toxicity (in tables). Excessive amount of toxic substances, such as sodium or sulfur, that severely hinder establishment of vegetation or severely restrict plant growth.

Trace elements. Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

Tuff. A compacted deposit that is 50 percent or more volcanic ash and dust.

Unstable fill (in tables). Risk of caving or sloughing on banks of fill material.

Upland (geology). Land at a higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Valley fill. In glaciated regions, material deposited in stream valleys by glacial melt water. In nonglaciated regions, alluvium deposited by heavily loaded streams.

Variant, soil. A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

Variegation. Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

Varve. A sedimentary layer of a lamina or sequence of laminae deposited in a body of still water within a year. Specifically, a thin pair of graded glaciolacustrine layers seasonally deposited, usually by melt water streams, in glacial lake or other body of still water in front of a glacier.

Weathering. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded. Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point). The moisture content of soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

Tables

TABLE 1.--TEMPERATURE AND PRECIPITATION

[Recorded in the period 1951-80 at Mineola, NY.]

Month	Temperature						Precipitation				
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have-- Maximum temperature higher than--	2 years in 10 will have-- Minimum temperature lower than--	Average number of growing degree days*	Average	2 years in 10 will have-- Less than--	2 years in 10 will have-- More than--	Average number of days with 0.10 inch or more	Average snowfall
	°F	°F	°F	°F	°F	Units	In	In	In		In
January----	37.3	25.5	31.4	59	4	25	3.31	1.51	4.84	7	7.4
February---	38.7	26.1	32.4	60	5	32	3.37	2.17	4.45	6	8.6
March------	46.4	33.1	39.8	70	16	84	4.44	2.90	5.83	8	5.4
April------	58.0	41.8	49.9	82	28	300	4.01	2.51	5.36	7	.4
May--------	68.3	51.2	59.8	90	38	614	3.46	1.82	4.88	7	.0
June-------	77.5	60.5	69.0	95	48	870	2.93	1.44	4.22	6	.0
July-------	82.8	66.4	74.6	97	56	1,073	3.17	1.28	4.75	6	.0
August-----	81.5	65.5	73.5	95	53	1,039	4.06	1.73	6.03	6	.0
September--	74.2	58.7	66.5	92	43	795	3.63	1.71	5.28	6	.0
October----	63.7	48.5	56.1	83	32	499	3.38	1.57	4.93	5	.1
November---	52.3	39.8	46.1	71	24	198	3.97	1.89	5.76	7	.4
December---	41.4	29.8	35.6	62	11	61	3.92	1.99	5.60	7	4.3
Yearly:											
Average--	60.2	45.6	52.9	---	---	---	---	---	---	---	---
Extreme--	---	---	---	99	3	---	---	---	---	---	---
Total----	---	---	---	---	---	5,590	43.65	35.93	51.02	78	26.6

* A growing degree day is a unit of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

[Recorded in the period 1951-80 at Mineola, NY.]

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Last freezing temperature in spring:			
1 year in 10 later than--	March 31	April 9	April 14
2 years in 10 later than--	March 25	April 3	April 10
5 years in 10 later than--	March 13	March 24	April 3
First freezing temperature in fall:			
1 year in 10 earlier than--	November 22	November 12	November 1
2 years in 10 earlier than--	November 27	November 16	November 5
5 years in 10 earlier than--	December 6	November 25	November 12

TABLE 3.--GROWING SEASON

[Recorded in the period 1951-80 at Mineola, NY.]

Probability	Length of growing season if daily minimum temperature is--		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	Days	Days	Days
9 years in 10	240	223	207
8 years in 10	250	231	212
5 years in 10	267	245	223
2 years in 10	285	259	233
1 year in 10	294	267	239

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
At	Atsion loamy sand	1,230	0.6
Bc	Beaches	2,070	1.1
Bd	Berryland mucky loamy sand	450	0.2
Du	Duneland-Udipsamments complex	1,490	0.8
EnA	Enfield silt loam, 0 to 3 percent slopes	3,670	1.9
EnB	Enfield silt loam, 3 to 8 percent slopes	2,770	1.4
Fr	Freetown muck	150	0.1
He	Hempstead silt loam	2,930	1.5
Ip	Ipswich mucky peat	8,770	4.6
Ma	Manahawkin muck	290	0.2
Mc	Matunuck mucky peat	570	0.3
MfA	Montauk fine sandy loam, 0 to 3 percent slopes	820	0.4
MfB	Montauk fine sandy loam, 3 to 8 percent slopes	6,770	3.5
MfC	Montauk fine sandy loam, 8 to 15 percent slopes	5,870	3.1
MfD	Montauk fine sandy loam, 15 to 25 percent slopes	520	0.3
MkA	Montauk silt loam, 0 to 3 percent slopes	1,880	1.0
MkB	Montauk silt loam, 3 to 8 percent slopes	5,320	2.8
Pa	Pawcatuck mucky peat	1,510	0.8
Pg	Pits, ground-water recharge	980	0.5
Pk	Pits, sand and gravel	850	0.4
PlB	Plymouth loamy sand, 3 to 8 percent slopes	980	0.5
PlC	Plymouth loamy sand, 8 to 15 percent slopes	730	0.4
PrD	Plymouth-Riverhead complex, 15 to 35 percent slopes	3,520	1.8
RdA	Riverhead sandy loam, 0 to 3 percent slopes	2,140	1.1
RdB	Riverhead sandy loam, 3 to 8 percent slopes	5,800	3.0
RdC	Riverhead sandy loam, 8 to 15 percent slopes	4,300	2.2
RdD	Riverhead sandy loam, 15 to 25 percent slopes	760	0.4
Sc	Scio silt loam	440	0.2
SdA	Scio silt loam, till substratum, 0 to 3 percent slopes	1,090	0.6
SdB	Scio silt loam, till substratum, 3 to 8 percent slopes	180	0.1
Su	Sudbury sandy loam	1,180	0.6
Ua	Udifluvents, rarely flooded	270	0.2
UdA	Udipsamments, nearly level	2,200	1.1
UdE	Udipsamments, steep	310	0.2
Ue	Udipsamments, wet substratum	5,700	3.0
Uf	Udorthents, refuse substratum	540	0.3
Ug	Urban land	18,360	9.7
Uh	Urban land-Hempstead complex	18,850	9.8
Um	Urban land-Mineola complex	2,550	1.3
UnB	Urban land-Montauk complex, 3 to 8 percent slopes	8,140	4.2
UnC	Urban land-Montauk complex, 8 to 15 percent slopes	1,330	0.7
UpA	Urban land-Plymouth complex, 0 to 3 percent slopes	800	0.4
UpB	Urban land-Plymouth complex, 3 to 8 percent slopes	1,570	0.8
UpC	Urban land-Plymouth complex, 8 to 15 percent slopes	430	0.2
UpD	Urban land-Plymouth complex, 15 to 25 percent slopes	420	0.2
UrA	Urban land-Riverhead complex, 0 to 3 percent slopes	39,220	20.5
UrB	Urban land-Riverhead complex, 3 to 8 percent slopes	5,380	2.8
UrC	Urban land-Riverhead complex, 8 to 15 percent slopes	1,040	0.5
Us	Urban land-Sudbury complex	5,470	2.8
Uu	Urban land-Udipsamments complex	1,250	0.7
Uw	Urban land-Udipsamments, wet substratum complex	6,390	3.3
Wa	Wallington silt loam	260	0.1
Wd	Walpole sandy loam	240	0.1
	Water	1,250	0.7
	Total	192,000	100.0

TABLE 5.--PRIME FARMLAND

(Only the soils considered prime farmland are listed. Urban or built-up areas of the soils listed are not considered prime farmland. If a soil is prime farmland only under certain conditions, the conditions are specified in parentheses after the soil name)

Map symbol	Soil name
EnA	Enfield silt loam, 0 to 3 percent slopes
He	Hempstead silt loam
MfA	Montauk fine sandy loam, 0 to 3 percent slopes
MfB	Montauk fine sandy loam, 3 to 8 percent slopes
MkA	Montauk silt loam, 0 to 3 percent slopes
MkB	Montauk silt loam, 3 to 8 percent slopes
RdA	Riverhead sandy loam, 0 to 3 percent slopes
RdB	Riverhead sandy loam, 3 to 8 percent slopes
Sc	Scio silt loam
SdA	Scio silt loam, till substratum, 0 to 3 percent slopes
Su	Sudbury sandy loam
Wa	Wallington silt loam (where drained)
Wd	Walpole sandy loam (where drained)

TABLE 6.--LAND CAPABILITY CLASSES AND VEGETABLE, FRUIT, AND FLOWER CROPS

(See text for definitions of "very good," "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil is not suited to the crops or that the crops generally are not grown on the soil. See text for examples of annuals, peremmials, and tree fruits and small fruits)

Soil name and map symbol	Land capability	Perennial vegetables, flowers and strawberries	Annual vegetables and flowers	Tree fruits and small fruits
At---------- Atsion	Vw	Poor	Poor	Poor
Bc*---------- Beaches	---	---	---	---
Bd---------- Berryland	Vw	Very poor	Very poor	Very poor
Du---------- Duneland-Udipsamments	---	---	---	---
EnA---------- Enfield	I	Very good	Very good	Very good
EnB---------- Enfield	IIe	Very good	Very good	Very good
Fr---------- Freetown	Vw	Very poor	Very poor	Very poor
He---------- Hempstead	I	Very good	Very good	Very good
Ip---------- Ipswich	VIIIw	---	---	---
Ma---------- Manahawkin	VIIw	Very poor	Very poor	Very poor
Mc---------- Matunuck	VIIIw	---	---	---
MfA---------- Montauk	I	Good	Good	Good
MfB---------- Montauk	IIe	Good	Good	Good
MfC---------- Montauk	IIIe	Fair	Fair	Good
MfD---------- Montauk	IVe	Fair	Fair	Fair
MkA---------- Montauk	I	Good	Very good	Good
MkB---------- Montauk	IIe	Good	Very good	Good
Pa---------- Pawcatuck	VIIIw	---	---	---
Pg*, Pk*---------- Pits	---	---	---	---
PlB---------- Plymouth	IIIs	Fair	Fair	Fair

See footnote at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND VEGETABLE, FRUIT, AND FLOWER CROPS--Continued

Soil name and map symbol	Land capability	Perennial vegetables, flowers and strawberries	Annual vegetables and flowers	Tree fruits and small fruits
PlC---------- Plymouth	IVs	Poor	Poor	Fair
PrD---------- Plymouth-Riverhead	IVs	Very poor	Very poor	Poor
RdA, RdB---------- Riverhead	IIs	Good	Good	Very good
RdC---------- Riverhead	IIIe	Fair	Fair	Good
RdD---------- Riverhead	IVe	Poor	Poor	Fair
Sc, SdA---------- Scio	IIw	Fair	Good	Fair
SdB---------- Scio	IIe	Fair	Good	Fair
Su---------- Sudbury	IIw	Fair	Fair	Poor
Ua---------- Udifluvents	---	Fair	Fair	Poor
UdA, UdE, UdF, Ue--------- Udipsamments	---	Poor	Poor	Poor
Uf---------- Udorthents	---	---	---	---
Ug---------- Urban land	---	---	---	---
Uh*---------- Urban land-Hempstead	---	Very good	Very good	Very good
Um*---------- Urban land-Mineola	---	Fair	Good	Fair
UnB*---------- Urban land-Montauk	---	Good	Good	Good
UnC*---------- Urban land-Montauk	---	Fair	Fair	Good
UpA*---------- Urban land-Plymouth	---	Fair	Fair	Fair
UpB*---------- Urban land-Plymouth	---	Fair	Fair	Fair
UpC*---------- Urban land-Plymouth	---	Poor	Poor	Fair
UpD*---------- Urban land-Plymouth	---	Very poor	Very poor	Poor

See footnote at end of table.

TABLE 6.--LAND CAPABILITY CLASSES AND VEGETABLE, FRUIT, AND FLOWER CROPS--Continued

Soil name and map symbol	Land capability	Perennial vegetables, flowers, and strawberries	Annual vegetables and flowers	Tree fruits and small fruits
		Tons	Tons	Crates
UrA*---------- Urban land-Riverhead	---	Good	Good	Very good
UrB*---------- Urban land-Riverhead	---	Good	Good	Very good
UrC*---------- Urban land-Riverhead	---	Fair	Fair	Good
Us*---------- Urban land-Sudbury	---	Fair	Fair	Poor
Uu*---------- Urban land-Udipsamments	---	Poor	Poor	Poor
Uw---------- Urban land-Udipsamments	---	Poor	Poor	Very poor
Wa---------- Wallington	IIIw	Poor	Fair	Very poor
Wd---------- Walpole	IIIw	Poor	Fair	Very poor

* See description of the map unit for composition and behavior characteristics of the map unit. Ratings are for the soil only.

TABLE 7--ORNAMENTAL TREES, SHRUBS, AND GROUND COVER

[Absence of an entry indicates that the soil was not rated and onsite investigation is required]

Soil name and map symbol	Deciduous trees	Evergreen trees	Deciduous shrubs and ground cover	Evergreen shrubs and ground cover
At---------- Atsion	Pin oak, willow oak, sweetgum, tulip tree, English oak, shadbush, sourgum, red maple.	Eastern arborviate------	Red osier dogwood, winterberry, fringe tree, chokeberry, sweet pepperbush, swamp azalea, highbush blueberry, buttonbush, lowbush blueberry*, fern*, yellowroot*, hosta*.	Rosebay rhododendron inkberry, Christmas fern*, bugle weed*, lily turf*.
Bc. Beaches				
Bd---------- Berryland	Pin oak, willow oak, sweetgum, tulip tree, English oak, shadbush sourgum, red maple.	Eastern arborviate------	Winged euonymus, redosier dogwood, winterberry, fringe tree, chokeberry lowbush blueberry*, sweet pepperbush, swamp azalea, highbush blueberry, buttonbush, fern*, yellow root*, hosta*.	Inkberry, rosebay rhododendron, Christmas fern*, bugle weed*, lily-turf*.
Du---------- Duneland-Udisamments	Shadbush, scrub oak-----	Japanses black pine, Eastern red cedar, American holly, pitch pine.	Japanese barberry, beach pea, bittersweet, Scotch broom, rugosa rose, chokeberry autum-olive, Virginia creeper*, seaside goldenrod*, beach plum, bayberry, dusty miller* American beachgrass*, Atlantic coastal panicgrass.	Shore juniper*, bearberry*, beach heather.

See footnote at end of table.

TABLE 7--ORNAMENTAL TREES, SHRUBS, AND GROUND COVER--Continued

Soil name and map symbol	Deciduous trees	Evergreen trees	Deciduous shrubs and ground cover	Evergreen shrubs and ground cover
EnA, EnB Enfield	European beech, flowering crabapple, ginkgo, littleleaf linden, pin oak, Japanese pagoda tree, Bradford pear, golden raintree, yellowwood, zelkova, false larch, sawtooth oak, crimean linden, kousa dogwood, tuplip tree, European hornbean, Amur cork tree, Chinese elm, honeylocust, sourwood scarlet oak, American hornbeam, white ash, shadbush, sweetgum, northern red oak, American beech, black birch, flowering dogwood.	Atlas cedar, white fir, Eastern hemlock, white pine, Oriental spruce, Douglas fir, Nordmann fir, Himalayan pine, Swiss stone pine, American holly.	Red osier dogwood, forsythia, frankilnia, Amur honeysuckle, winterberry, fringe tree, chokeberry, abelia, cornelian cherry, viburnum, fothergilla, Washington hawthorn, witch-hazel, deciduous azalea, winged euonymus, highbush blueberry, cotoneasters*, hosta*, barrenwort*.	Azalea, Japanese holly, mountain laurel, Mugo pine, rhododendron yew, Japanese andromeda, leucothoe, skimmia, inkberry evergreen euonymus* pachysandra*, English ivy*, juniper*, periwinkle*.
Fr Freetown	Red maple, sourgum, alder, American hornbean, tulip tree, American beech shadbush.	Easterm arborvitae	Highbush blueberry, chokeberry, winterberry groundsel-tree, swamp azalea, spice bush, sweet pepperbush fern*.	Rosebay rhododendron, galax*, shortia*.
He Hempstead	European beech, flowering crabapple, ginko, little-leaf linden, pin oak, Japanese pagoda tree, Bradford pear, golden raintree, yellowwood, zelkova, false larch, sawtooth oak, crimean linden, honeylocust, sourwood, kousa dogwood, tulip tree European hornbean, Amur cork tree, Chinese elm, northern red oak, American beech, black birch, flowering dogwood, shadbush sweetgum, white ash, American hornbeam, scarlet oak.	Atlas cedar, white fir, Eastern hemlock, white pine, Oriental spruce, Douglas fir, Nordmann fir, Himalayan pine, Swiss stone pine, American holly.	Red osier dogwood, forsythia,franklinia, Amur honeysuckle, winterberry, fringe tree, chokeberry, abelia, cornelian cherry, dogwood, viburnum, Washington thorn, fothergilla deciduous azalea, winged euonymus, witch hazel, highbush blueberry, cottoneaster, hosta*, barrenwort*.	Inkberry, azalea, Japanese holly, skimmia, mountain laurel, Mugo pine, rhododendron, yew, English holly, Japanese andromeda, leucothoe, evergreen euonymus*, pachysandra*, English ivy*, juniper*, periwinkle*.

See footnote at end of table.

TABLE 7--ORNAMENTAL TREES, SHRUBS, AND GROUND COVER--Continued

Soil name and map symbol	Deciduous trees	Evergreen trees	Deciduous shrubs and ground cover	Evergreen shrubs and ground cover
Ip Ipswich			Groundsel-tree, marsh-elder, bayberry, smooth cordgrass, salt meadow cordgrass.	
Ma Manahawkin	Red maple, sourgum, alder, American hornbean, tulip tree, American beech.	Eastern arborviate	Chokeberry, shadbush, highbush blueberry, groundsel-tree, swamp azalea, spice bush, sweet pepper bush, winterberry, fern*.	Rosebay rhododendron, galax*, shortia*.
Mc Matunuck			Groundsel-tree, marsh-elder, bayberry, smooth cordgrass, saltmeadow cordgrass.	
MfA, MfB, MfC, MfD, MkA, MkB Montauk	European beech, flowering crabapple, ginkgo, little-leaf linden, pin oak, Japanese pagoda tree, Bradford pear, golden raintree, honeylocust, sourwood, yellowwood, zelkova, false larch, sawtooth oak, crimean linden, kousa dogwood tulip tree, European horbean, Amur cork tree, Chinese elm, northern red oak, American beech, black birch, flowering dogwood, scarlet oak, shadbush, sweetgum, American hornbeam, white ash.	Atlas cedar, white fir, Eastern hemlock, white pine, Oriental spruce, Douglas fir, Nordman fir, Himalavan pine, Swiss stone pine, American holly.	Red osier dogwood, forsythia, franklinia, Amur honeysuckle, winterberry, fringe tree, chokeberry abelia cornelian cherry, fothergilla, viburum, Washington thorn witch-hazel, highbush blueberry, deciduous azalea, winged euonymus cotoneaster*, hosta*, barrenwort*.	Azalea, Japanese holly, mountain laurel, Mugo pine, rhododendron, yew, English holly, Japanses andromeda, leucothoe, skimmia, pachysandra*, English ivy*, inkberry evergreen euonymus*, periwinkle*, juniper*.
Pa Pawcatuck			Groundsel-tree, marsh-elder, bayberry, smooth cordgrass, saltmeadow cordgrass.	
Pg Pits				

See footnote at end of table.

TABLE 7--ORNAMENTAL TREES, SHRUBS, AND GROUND COVER--Continued

Soil name and map symbol	Deciduous trees	Evergreen trees	Deciduous shrubs and ground cover	Evergreen shrubs and ground cover
Pk---------- Pits	Black locust----------	Japanese black pine-----	Winged euonymus, Japanese honeysuckle, Japanses barberry, Scotch-broome Regal's privet, Amur privet, autumn olive, Arnot bristly locust, rose species, sumac birdsfoot trefoil*, sweetfern*, Virginia creeper, alpine current*, bush honeysuckle*.	Juniper*, bearberry*.
P1B, P1C, PrD---------- Plymouth	Honeylocust, golden raintree, hawthorn, Amur maple, Tallhedge buckthorne, white poplar, northern red oak, Turkish filbert, American beech, black locust, chestnut oak, white ash, crabapple, red maple, black birch.	Japanese, black pine, lacebark pine, Eastern white pine, red pine, Eastern red cedar, American holly.	Sumac, Arnot bristly locust, rugosa rose, redstem dogwood, forsythia, diervilla, Japanese honeysuckle, Japanese barberry, scotchbroom, five-leaf aralia, Regel's Amur or California Privet, autum olive, cotoneaster, dwarf flowering quince, Anthony Waterer spirea, fragrant sumac, sweet peperbush, highbush Blueberry, witch-hazel, bayberry, pinxterbloom, Virginia creeper*.	Mountain laurel, juniper*, bearberry*.

See footnote at end of table.

TABLE 7--ORNAMENTAL TREES, SHRUBS, AND GROUND COVER--Continued

Soil name and map symbol	Deciduous trees	Evergreen trees	Deciduous shrubs and ground cover	Evergreen shrubs and ground cover
RdA, RdB, RdC, RdD---------- Riverhead	European beech, flowering crabapple, ginko, little-leaf linden, pin oak, Japanese pagoda tree, Bradford pear, golden raintree, yellowwood, zelkova, false larch, sawtooth oak, crimeon linden, tulip tree, European hornbean, kousa dogwood, Amur cork tree, Chinese elm, honey locust, sourwood, northern red oak, American beech, black birch, flowering dogwood, shadbush, sweetgum, scarlet oak, white ash American hornbeam.	Atlas cedar, white fir, Eastern hemlock, white pine, Oriental spruce, Douglas fir, Nordmann fir, Himalayan pine, Swiss stone pine, American holly.	Washignton thorn, red osier dogwood, forsythia, Amur honeysuckle, winter-berry fringe tree, abelia, cornelian cherry, viburnum, fothergilla, deciduous azalea, winged euonymus witch-hazel, highbush blueberry, chokeberry, cotoneaster*, hosta*, barrenwort*.	Inkberry, skimmia, azalea, Japanese holly, mountain laurel, Mugo pine, rhododendron, yew, English holly, Japanese andromeda, leucothoe, evergreen euonymus*, pachysandra*, English ivy*, juniper*, periwinkle*.
Sc, SdA, SdB---------- Scio	Flowering crabapple ginkgo, littleleaf linden, pin oak, Japanese pagoda tree, Bradford pear, golden raintree, yellowwood, zelkova, false larch, sawthooth oak, crimean linden, tulip tree, European honeylocust, sourwood, hornbean, phellodendron, Chinese elm, northern red oak American beech, black birch, flowering dogwood, scarlet oak, white ash, American hornbeam, shadbush, sweetgum.	Atlas cedar, white fir, Eastern hemlock, white pine, Oriental spruce, Douglas fir, Nordam fir, Himalayan pine, Swiss stone pine, American holly.	Washington thorn, red osier dogwood, forsythia, franklinia, Amur honeysuckle, winterberry, fringe tree, chokeberry, abelia, cornelian cherry, viburum, fothergilla, deciduous azalea, winged euonymus witchhazel, highbush blueberry, cotoneasters*, hosta*, barrenwort*.	Skimmia, azalea, Japanese holly, mountain laurel, Mugo pine, rhododendron, yew, English holly, Japanese andromeda, leucothoe, inkberry, evergreen euonymus*, pachysandra*, English ivy, juniper*, periwinkle*.

See footnote at end of table.

TABLE 7--ORNAMENTAL TREES, SHRUBS, AND GROUND COVER--Continued

Soil name and map symbol	Deciduous trees	Evergreen trees	Deciduous shrubs and ground cover	Evergreen shrubs and ground cover
Su Sudbury	Flowering crabapple ginkgo, littleleaf linden, pin oak, Japanese pagoda tree, Bradford pear, golden raintree, yellowwood, zelkova, false larch, sawthooth oak, crimean linden, tulip tree, European honeylocust, sourwood, hornbean, phellodendron, Chinese elm, northern red oak American beech, black birch, flowering dogwood, scarlet oak, white ash, American hornbeam, shadbush, sweetgum.	Atlas cedar, white fir, Eastern hemlock, white pine, Oriental spruce, Douglas fir, Nordam fir, Himalayan pine, Swiss stone pine, American holly.	Washington thorn, red osier dogwood, forsythia, franklinia, Amur honeysuckle, winterberry, fringe tree, chokeberry, abelia, cornelian cherry, viburum, fothergilla, deciduous azalea, winged euonymus witchhazel, highbush blueberry, cotoneasters*, hosta*, barrenwort*.	Skimmia, azalea, Japanese holly, mountain laurel, Mugo pine, rhododendron, yew, English holly, Japanese andromeda, leucothoe, inkberry, evergreen euonymus*, pachysandra*, English ivy, juniper*, periwinkle*.
Ua Udifluvents	European beech, flowering crabapple, ginkgo, littleleaf linden, pin oak, Japanese pagoda tree, Bradford pear, golden raintree, yellowwood, zelkova, false larch, sawtooth oak, crimean linden, kousa dogwood, tulip tree, European hornbean, Amur cork tree, Chinese elm, honey locust, sourwood northern red oak, American beech, black birch, flowering dogwood, white ash, American hornbeam, shadbush, sweetgum, scarlet oak.	Atlas cedar, white fir, eastern hemlock, white pine, Oriental spruce, Douglas fir, Nordman fir, Himalayan pine, Swiss stone pine, American holly.	Washington thorn, red osier, dogwood, forsythia, franklinia, Amur honeysuckle, winterberry fringe tree chokeberry, abelia, cornelian cherry, viburnum, fothergilla, deciduous azalea, winged euonymus, witchhazel, highbush blueberry, cotoneasters hosta*, epimedium*, barrenwort*.	Inkberry, skimmia, azalea, Japanese holly, mountain laurel, Mugo pine, rhododendron, yew, English holly, Japanese andromeda, leucothoe, evergreen euonymus, juniper*, pachysandra, English ivy*, periwinkle*.

See footnote at end of table.

TABLE 7--ORNAMENTAL TREES, SHRUBS, AND GROUND COVER--Continued

Soil name and map symbol	Deciduous trees	Evergreen trees	Deciduous shrubs and ground cover	Evergreen shrubs and ground cover
UdA---------- Udipsamments	Honeylocust, golden raintree, hawthorn, crabapple, Amur maple, Tallhedge buckthorne, white poplar, Turkish filbert, northern red oak, red maple, black birch, black locust, chestnut oak, American beech, white ash, red oak.	Eastern white pine, Japanese black pine, red pine, lacebark pine, Eastern redcedar.	Fragrant sumac, multiflora rose, Arnot bristly locust, rugosa rose, redstem dogwood, forsythia, Japanese honeysuckle, Japanese barberry, scotchbroom, five-leaf aralia, Regel's Amur, California privet, autum olive, cotoneaster, dwarf flowering quince, Anthony Waterer spirea, sweet pepperbush, highbush blueberry, witchhazel, sumac, bayberry, pinxterbloom, bush honeysuckle*, Virginia creeper*.	Bearberry*, mountain laurel, juniper*.
UdE---------- Udipsamments		Japanese black pine-----	Winged euonymus, Japanese honeysuckle, Japanese barberry, Scotch broome Regal's privet, Amur privet, autumn olive, Arnot bristly locust, red stem dogwood, sumac rose species*, apline current, Virginia creeper*, birdsfoot trefoil*, sweetfern* bush honeysuckle*.	Bearberry*, juniper*.
Ue---------- Udipsamments	Shadbush, scrub oak-----	Japanese black pine, Eastern redcedar, American holly, pitch pine.	Japanese barberry, beach pea, bittersweet, scotch broom, rugosa rose, chokeberry, autum olive, Virginia creeper*, seaside goldenrod*, beach plum, bayberry, dusty miller* American beachgrass*, Atlantic coastal panicgrass.	Bearberry*, shore juniper* beach heather*.
Uf---------- Udorthents				

See footnote at end of table.

TABLE 7--ORNAMENTAL TREES, SHRUBS, AND GROUND COVER--Continued

Soil name and map symbol	Deciduous trees	Evergreen trees	Deciduous shrubs and ground cover	Evergreen shrubs and ground cover
Ug** Urban land	Bradford pear, pin oak, hedge maple, svcamore maple, tree of heaven, hackberry, Cornelian cherry, green ash, ginkgo, honeylocust, Kentucky coffee tree, golden raintree, crabapple, Amur cork tree, willow oak, English oak, Japanese pagoda tree, linden, zelkova, littleleaf linden, Crimean linden Turkish filbert.		Lavelle hawthorn, Washington thorn, fringe tree.	
Uh Urban land-Hemstead	Cornelian cherry, hedge maple, sycamore maple, tree of heaven, hackberry, green ash, ginkgo, honey-locust, Kentucky coffee tree, golden raintree, crabapple, Amur cork tree, Bradford pear, pin oak, willow oak, English oak, Japanese pagoda tree, sourwood, Japanese snowbell, Carolina silverbell, zelkova, Kousa dogwood, Amur maple, American hornbeam.	Eastern red cedar	Lavelle hawthorn, fringe tree, Washington thorn Japanese tree lilac, cockspur thorn.	
Um Urban land-Mineola	Hedge maple, Amur maple, golden raintree, Bradford pear, willow oak, ginkgo, honey-locust, shingle oak, pin oak, zelkova, American hornbeam, northern red oak.	Japanese black pine, Eastern red cedar.	Lavelle hawthorn, cockspur thorn, Washington thorn.	

See footnote at end of table.

TABLE 7--ORNAMENTAL TREES, SHRUBS, AND GROUND COVER--Continued

Soil name and map symbol	Deciduous trees	Evergreen trees	Deciduous shrubs and ground cover	Evergreen shrubs and ground cover
UnB, UnC---------- Urban land-Montauk	Cornelian cherry, hedge maple, sycamore maple, tree of heaven, hackberry, green ash, ginkgo, honeylocust, Kentucky coffee tree, golden rain tree, crabapple, Amur cork tree, Bradford pear, pin oak, willow oak, English oak, Japanese pagoda tree, zelkova, Amur maple, Kousa dogwood, sourwood, Japanese snowbell, Carolina silverbell American hornbeam.	Eastern red cedar-------	Washington thorn, fringe tree, Lavelle hawthorn, Japanese tree lilac, cockspur thorn.	
UpA, UpB, UpC, UpD---------- Urban land-Plymouth	American hornbeam, hedge maple, Amur maple, golden raintree, Bradford pear, willow oak, ginkgo, honeylocust, shingle oak, pin oak, zelkova, Turkish filbert, northern red oak.	Japanese black pine, Eastern red cedar.	Washington thorn, Lavelle hawthorn, cockspur thorn.	
UrA, UrB, UrC---------- Urban land-Riverhead	Kousa dogwood, Cornelian cherry, hedge maple, sycamore maple, tree of heaven, hackberry, green ash, ginkgo, honeylocust, Kentucky coffee tree, golden rain-tree, crabapple, Amur cork tree, Bradford pear, pin oak willow oak, English oak, sourwood, Japanese snowbell, Carolina silverbell, Japanese pagoda tree, linden, zelkova, Amur maple, American hornbeam.	Eastern red cedar-------	Fringe tree, Lavelle hawthorn, Washington thorn, Japanese tree lilac, cockspur thorn.	

See footnote at end of table.

TABLE 7--ORNAMENTAL TREES, SHRUBS, AND GROUND COVER--Continued

Soil name and map symbol	Deciduous trees	Evergreen trees	Deciduous shrubs and ground cover	Evergreen shrubs and ground cover
Us---------- Urban land-Sudbury	American hornbeam, hedge maple, Amur maple, golden raintree, Bradford pear, willow oak, ginkgo, honey-locust, shingle oak, pin oak, zelkova, northern red oak.	Japanese black pine, Eastern red cedar.	Lavelle hawthorn, Washington thorn, cockspur thorn.	
Uu---------- Urban land-Udisamments	Amur maple, golden rain tree, Bradford pear, willow oak, ginkgo, honeylocust, red oak, shingle oak, pin oak, zelkova, hedge maple, Turkish filbert, American hornbeam.	Japanese black pine, Eastern red cedar	Lavelle hawthorn, Washignton and cockspur thorn.	
Uw---------- Udipsamments, wet substratum	Shadbush, honeylocust, sycamore maple, willow oak.	Japanese black pine, Eastern red cedar.	Cotoneaster, autumn olive.	Japanese yew, shore juniper, Mugo pine.
Wa---------- Wallington	Pin oak, willow oak, sweetgum, tulip tree, English oak, shadbush, sourgum, red maple.	Eastern arborviate------	Red osier, dogwood, winterberry, fringe tree, nannyberry sweet pepperbush, swamp swamp azalea, highbush blueberry, buttonbush, chokeberry, fern*, yellow root*, hosta*, lowbush blueberry*.	Rosebay rhododendron, inkberry, Christmas fern*, bugle weed*, lily-turf*.
Wd---------- Walpole	Pin oak, willow oak, sweetgum, tulip tree, English oak, shadbush, sourgum, red maple.	Eastern arborviate------	Red osier dogwood, winterberry, fringe tree, chokeberry, nannyberry, sweet pepperbush, swamp azalea, highbush blueberry, buttonbush, fern*, yellow root*, hosta*, lowbush blueberry*.	Inkberry, rosebay rhododendron, Christmas fern*, bugle weed*, lily-turf*.

*Ground cover.

**Included soils only.

TABLE 8.--RECREATIONAL DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
At Atsion	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.	Severe: wetness, too sandy.
Bc*. Beaches					
Bd Berryland	Severe: wetness.	Severe: wetness.	Severe: wetness, too sandy.	Severe: wetness.	Severe: wetness, too sandy.
Du*: Duneland.					
Udipsamments.					
EnA Enfield	Slight	Slight	Slight	Severe: erodes easily.	Slight.
EnB Enfield	Slight	Slight	Moderate: slope.	Severe: erodes easily.	Slight.
Fr Freetown	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, excess humus.	Severe: wetness, excess humus.
He Hempstead	Slight	Slight	Slight	Severe: erodes easily.	Slight.
Ip Ipswich	Severe: ponding, flooding, excess humus.	Severe: ponding, excess humus, excess salt.	Severe: ponding, flooding, excess humus.	Severe: ponding, excess humus.	Severe: ponding, excess salt.
Ma Manahawkin	Severe: flooding, excess humus, ponding.	Severe: ponding, excess humus.	Severe: flooding, excess humus, ponding.	Severe: ponding, excess humus.	Severe: ponding, flooding, excess humus.
Mc Matunuck	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus, excess salt.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: excess salt, excess sulfur, ponding.
MfA, MfB Montauk	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: small stones, slope.	Slight	Slight.
MfC Montauk	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
MfD Montauk	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
MkA Montauk	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: small stones.	Slight	Slight.
MkB Montauk	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones.	Slight	Slight.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Pa---------- Pawcatuck	Severe: flooding, ponding, excess humus.	Severe: ponding, excess humus, excess salt.	Severe: excess humus, ponding, flooding.	Severe: ponding, excess humus.	Severe: excess salt, excess sulfur, ponding.
Pg*, Pk*. Pits					
PlB---------- Plymouth	Slight----------	Slight----------	Severe: small stones.	Slight----------	Moderate: too sandy.
PlC---------- Plymouth	Moderate: slope.	Moderate: slope.	Severe: slope, small stones.	Slight----------	Moderate: too sandy.
PrD*: Plymouth----------	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.	Severe: slope.
Riverhead----------	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
RdA---------- Riverhead	Slight----------	Slight----------	Slight----------	Slight----------	Slight.
RdB---------- Riverhead	Slight----------	Slight----------	Moderate: slope.	Slight----------	Slight.
RdC---------- Riverhead	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight----------	Moderate: slope.
RdD---------- Riverhead	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.	Severe: slope.
Sc, SdA---------- Scio	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.
SdB---------- Scio	Moderate: wetness.	Moderate: wetness.	Moderate: slope, wetness.	Moderate: erodes easily, wetness.	Moderate: wetness.
Su---------- Sudbury	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, small stones.	Slight----------	Slight.
Ua. Udifluvents					
UdA, UdE, Ue. Udipsamments					
Uf. Udorthents					
Ug*. Urban land					
Uh*: Urban land.					

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Uh*: Hempstead	Slight	Slight	Slight	Severe: erodes easily.	Slight.
Um*: Urban land.					
Mineola	Moderate: small stones, wetness.	Moderate: wetness, small stones.	Severe: small stones.	Slight	Severe: droughty.
UnB*: Urban land.					
Montauk	Moderate: percs slowly.	Moderate: percs slowly.	Moderate: slope, small stones.	Slight	Slight.
UnC*: Urban land.					
Montauk	Moderate: slope, percs slowly.	Moderate: slope, percs slowly.	Severe: slope.	Slight	Moderate: slope.
UpA*, UpB*: Urban land.					
Plymouth	Slight	Slight	Severe: small stones.	Slight	Moderate: too sandy.
UpC*: Urban land.					
Plymouth	Moderate: slope.	Moderate: slope.	Severe: slope, small stones.	Slight	Moderate: too sandy.
UpD*: Urban land.					
Plymouth	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.	Severe: slope.
UrA*: Urban land.					
Riverhead	Slight	Slight	Slight	Slight	Slight.
UrB*: Urban land.					
Riverhead	Slight	Slight	Moderate: slope.	Slight	Slight.
UrC*: Urban land.					
Riverhead	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight	Moderate: slope.

See footnote at end of table.

TABLE 8.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails	Golf fairways
Us*: Urban land.					
Sudbury	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, small stones.	Slight	Slight.
Uu*, Uw*: Urban land.					
Udipsamments.					
Wa Wallington	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.	Severe: wetness.
Wd Walpole	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--WILDLIFE HABITAT

(See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated)

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
At---------- Atsion	Poor	Fair	Fair	Fair	Fair	Fair	Good	Fair	Fair	Fair.
Bc*. Beaches										
Bd---------- Berryland	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
Du*: Duneland.										
Udipsamments.										
EnA---------- Enfield	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
EnB---------- Enfield	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Fr---------- Freetown	Very poor.	Poor	Poor	Poor	Poor	Good	Good	Poor	Poor	Good.
He---------- Hempstead	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Ip---------- Ipswich	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
Ma---------- Manahawkin	Very poor.	Poor	Poor	Poor	Poor	Good	Poor	Very poor.	Very poor.	Fair.
Mc---------- Matunuck	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
MfA---------- Montauk	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MfB---------- Montauk	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MfC---------- Montauk	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
MfD---------- Montauk	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
MkA---------- Montauk	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
MkB---------- Montauk	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Pa---------- Pawcatuck	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Good	Good	Very poor.	Very poor.	Good.
Pg*, Pk*. Pits										

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
PlB---------- Plymouth	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
PlC---------- Plymouth	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
PrD*:										
Plymouth----------	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
Riverhead---------	Very poor.	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
RdA---------- Riverhead	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
RdB---------- Riverhead	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
RdC---------- Riverhead	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
RdD---------- Riverhead	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.
Sc, SdA---------- Scio	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
SdB---------- Scio	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Su---------- Sudbury	Good	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Ua. Udifluvents										
UdA, UdE, Ue. Udipsamments										
Uf. Udorthents										
Ug*. Urban land										
Uh*: Urban land.										
Hempstead---------	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
Um*: Urban land.										
Mineola----------	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
UnB*: Urban land.										
Montauk----------	Fair	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.

See footnote at end of table.

TABLE 9.--WILDLIFE HABITAT--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--		
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife
UnC*: Urban land.										
Montauk	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
UpA*: Urban land.										
Plymouth	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
UpB*: Urban land.										
Plymouth	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
UpC*: Urban land.										
Plymouth	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
UpD*: Urban land.										
Plymouth	Very poor.	Poor	Poor	Very poor.	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Very poor.
UrA*: Urban land.										
Riverhead	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Good	Very poor.
UrB*, UrC*: Urban land.										
Riverhead	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.
Us*: Urban land.										
Sudbury	Fair	Good	Good	Good	Good	Poor	Poor	Good	Good	Poor.
Uu*, Uw*: Urban land.										
Udipsamments.										
Wa Wallington	Fair	Good	Good	Good	Good	Fair	Fair	Good	Good	Fair.
Wd Walpole	Poor	Fair	Fair	Fair	Fair	Good	Good	Fair	Fair	Good.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--BUILDING SITE DEVELOPMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
At---------- Atsion	Severe: wetness, cutbanks cave.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, too sandy.
Bc*. Beaches						
Bd---------- Berryland	Severe: wetness, cutbanks cave.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: wetness, flooding.	Severe: wetness.	Severe: wetness, too sandy.
Du*: Duneland.						
Udipsamments.						
EnA, EnB. Enfield						
Fr---------- Freetown	Severe: wetness, excess humus.	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength.	Severe: wetness, low strength, frost action.	Severe: wetness, excess humus.
He---------- Hempstead	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Moderate: frost action.	Slight.
Ip---------- Ipswich	Severe: ponding, excess humus.	Severe: ponding, flooding, low strength.	Severe: ponding, flooding, low strength.	Severe: ponding, flooding, low strength.	Severe: ponding, low strength, flooding.	Severe: ponding, excess salt.
Ma---------- Manahawkin	Severe: cutbanks cave, excess humus, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding, frost action.	Severe: ponding, flooding, excess humus.
Mc---------- Matunuck	Severe: cutbanks cave, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: flooding, ponding.	Severe: ponding, flooding.	Severe: excess salt, excess sulfur, ponding.
MfA---------- Montauk	Moderate: dense layer, wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, frost action.	Slight.
MfB---------- Montauk	Moderate: dense layer, wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, slope.	Moderate: wetness, frost action.	Slight.
MfC---------- Montauk	Moderate: dense layer, wetness, slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: wetness, slope, frost action.	Moderate: slope.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
MfD---------- Montauk	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
MkA---------- Montauk	Moderate: dense layer, wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, frost action.	Slight.
MkB---------- Montauk	Moderate: dense layer, wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, slope.	Moderate: wetness, frost action.	Slight.
Pa---------- Pawcatuck	Severe: cutbanks cave, excess humus, wetness.	Severe: flooding, ponding, low strength.	Severe: flooding, ponding.	Severe: flooding, ponding, low strength.	Severe: ponding, flooding.	Severe: excess salt, excess sulfur, ponding.
Pg*, Pk*. Pits						
PlB---------- Plymouth	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Slight---------	Moderate: too sandy.
PlC---------- Plymouth	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: too sandy.
PrD*: Plymouth---------	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Riverhead--------	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
RdA---------- Riverhead	Severe: cutbanks cave.	Slight---------	Slight---------	Slight---------	Moderate: frost action.	Slight.
RdB---------- Riverhead	Severe: cutbanks cave.	Slight---------	Slight---------	Moderate: slope.	Moderate: frost action.	Slight.
RdC---------- Riverhead	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
RdD---------- Riverhead	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Sc, SdA---------- Scio	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Severe: frost action.	Moderate: wetness.
SdB---------- Scio	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness, slope.	Severe: frost action.	Moderate: wetness.
Su---------- Sudbury	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, frost action.	Slight.

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
Ua. Udifluvents						
UdA, UdE, Ue. Udipsamments						
Uf. Udorthents						
Ug*. Urban land						
Uh*: Urban land.						
Hempstead	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Slight.
Um*: Urban land.						
Mineola	Severe: cutbanks cave, wetness.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, frost action.	Severe: droughty.
UnB*: Urban land.						
Montauk	Moderate: dense layer, wetness.	Moderate: wetness.	Moderate: wetness.	Moderate: wetness, slope.	Moderate: wetness, frost action.	Slight.
UnC*: Urban land.						
Montauk	Moderate: dense layer, wetness, slope.	Moderate: wetness, slope.	Moderate: wetness, slope.	Severe: slope.	Moderate: wetness, slope, frost action.	Moderate: slope.
UpA*: Urban land.						
Plymouth	Severe: cutbanks cave.	Slight	Slight	Slight	Slight	Moderate: too sandy.
UpB*: Urban land.						
Plymouth	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Slight	Moderate: too sandy.
UpC*: Urban land.						
Plymouth	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.	Moderate: too sandy.
UpD*: Urban land.						

See footnote at end of table.

TABLE 10.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Dwellings with basements	Small commercial buildings	Local roads and streets	Lawns and landscaping
UpD*: Plymouth	Severe: slope, cutbanks cave.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
UrA*: Urban land.						
Riverhead	Severe: cutbanks cave.	Slight	Slight	Slight	Moderate: frost action.	Slight.
UrB*: Urban land.						
Riverhead	Severe: cutbanks cave.	Slight	Slight	Moderate: slope.	Moderate: frost action.	Slight.
UrC*: Urban land.						
Riverhead	Severe: cutbanks cave.	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.	Moderate: slope.
Us*: Urban land.						
Sudbury	Severe: wetness, cutbanks cave.	Moderate: wetness.	Severe: wetness.	Moderate: wetness.	Moderate: wetness, frost action.	Slight.
Uu*, Uw*: Urban land.						
Udipsamments.						
Wa Wallington	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.
Wd Walpole	Severe: cutbanks cave, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, frost action.	Severe: wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 11.--SANITARY FACILITIES

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "good," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Effluent absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
At---------- Atsion	Severe: wetness, poor filter.	Severe: wetness, seepage.	Severe: seepage, wetness, too sandy.	Severe: wetness, seepage.	Poor: seepage, too sandy, wetness.
Bc*. Beaches					
Bd---------- Berryland	Severe: wetness.	Severe: wetness, seepage, flooding.	Severe: wetness, seepage.	Severe: wetness, seepage.	Poor: wetness, too sandy.
Du*: Duneland.					
Udipsamments.					
EnA, EnB. Enfield					
Fr---------- Freetown	Severe: wetness.	Severe: wetness, excess humus, seepage.	Severe: wetness, excess humus, seepage.	Severe: wetness, seepage.	Poor: excess humus, wetness.
He---------- Hempstead	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
Ip---------- Ipswich	Severe: ponding, flooding.	Severe: seepage, flooding, excess humus.	Severe: ponding, flooding, seepage.	Severe: ponding, flooding, seepage.	Poor: excess humus, ponding, excess salt.
Ma---------- Manahawkin	Severe: flooding, ponding.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: ponding, excess humus.
Mc---------- Matunuck	Severe: flooding, ponding, poor filter.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: seepage, too sandy, ponding.
MfA, MfB---------- Montauk	Severe: percs slowly, wetness.	Severe: seepage.	Moderate: wetness.	Severe: seepage.	Poor: seepage.
MfC---------- Montauk	Severe: percs slowly, wetness.	Severe: slope, seepage.	Moderate: slope, wetness.	Severe: seepage.	Poor: seepage.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Effluent absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
MfD---------- Montauk	Severe: slope, percs slowly, wetness.	Severe: slope, seepage.	Severe: slope.	Severe: slope, seepage.	Poor: seepage, slope.
MkA, MkB---------- Montauk	Severe: percs slowly, wetness.	Severe: seepage.	Moderate: wetness.	Severe: seepage.	Poor: seepage.
Pa---------- Pawcatuck	Severe: flooding, ponding, poor filter.	Severe: seepage, flooding, excess humus.	Severe: flooding, seepage, ponding.	Severe: flooding, seepage, ponding.	Poor: ponding, excess humus, excess salt.
Pg*, Pk*. Pits					
PlB---------- Plymouth	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, thin layer.
PlC---------- Plymouth	Severe: poor filter.	Severe: slope, seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, thin layer.
PrD*: Plymouth---------- Riverhead----------	Severe: slope, poor filter. Severe: poor filter, slope.	Severe: slope, seepage. Severe: slope, seepage.	Severe: slope, seepage, too sandy. Severe: slope, seepage, too sandy.	Severe: slope, seepage. Severe: slope, seepage.	Poor: slope, seepage, too sandy. Poor: seepage, too sandy, slope.
RdA, RdB---------- Riverhead	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
RdC---------- Riverhead	Severe: poor filter.	Severe: slope, seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
RdD---------- Riverhead	Severe: poor filter, slope.	Severe: slope, seepage.	Severe: slope, seepage, too sandy.	Severe: slope, seepage.	Poor: seepage, too sandy, slope.
Sc---------- Scio	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness.	Severe: wetness.	Fair: wetness, thin layer.
SdA, SdB---------- Scio	Severe: wetness, percs slowly.	Moderate: seepage.	Severe: wetness.	Severe: wetness.	Fair: wetness, thin layer.
Su---------- Sudbury	Severe: wetness, poor filter.	Severe: wetness, seepage.	Severe: wetness, seepage, too sandy.	Severe: wetness, seepage.	Poor: seepage, too sandy, small stones.

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Effluent absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
Ua. Udifluvents					
UdA, UdE, Ue. Udipsamments					
Uf. Udorthents					
Ug*. Urban land					
Uh*: Urban land.					
Hempstead	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
Um*: Urban land.					
Mineola	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, small stones.
UnB*: Urban land.					
Montauk	Severe: percs slowly, wetness.	Severe: seepage.	Moderate: wetness.	Severe: seepage.	Poor: seepage.
UnC*: Urban land.					
Montauk	Severe: percs slowly, wetness.	Severe: slope, seepage.	Moderate: slope, wetness.	Severe: seepage.	Poor: seepage.
UpA*, UpB*: Urban land.					
Plymouth	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, thin layer.
UpC*: Urban land.					
Plymouth	Severe: poor filter.	Severe: slope, seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, thin layer.
UpD*: Urban land.					

See footnote at end of table.

TABLE 11.--SANITARY FACILITIES--Continued

Soil name and map symbol	Effluent absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
UpD*:					
Plymouth	Severe: slope, poor filter.	Severe: slope, seepage.	Severe: slope, seepage, too sandy.	Severe: slope, seepage.	Poor: slope, seepage, too sandy.
UrA*, UrB*:					
Urban land.					
Riverhead	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
UrC*:					
Urban land.					
Riverhead	Severe: poor filter.	Severe: slope, seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
Us*:					
Urban land.					
Sudbury	Severe: wetness, poor filter.	Severe: wetness, seepage.	Severe: wetness, seepage, too sandy.	Severe: wetness, seepage.	Poor: seepage, too sandy, small stones.
Uu*, Uw*:					
Urban land.					
Udipsamments.					
Wa	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness.	Severe: wetness.	Poor: wetness.
Wallington					
Wd	Severe: wetness, poor filter.	Severe: seepage, wetness.	Severe: seepage, wetness, too sandy.	Severe: seepage, wetness.	Poor: seepage, too sandy, wetness.
Walpole					

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--CONSTRUCTION MATERIALS

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
At Atsion	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness, too sandy.
Bc*. Beaches				
Bd Berryland	Poor: wetness.	Probable	Improbable: too sandy.	Poor: wetness, too sandy.
Du*: Duneland.				
Udipsamments.				
EnA, EnB. Enfield				
Fr Freetown	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: excess humus, wetness.
He Hempstead	Good	Probable	Probable	Poor: area reclaim, small stones.
Ip Ipswich	Poor: wetness, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness, excess salt, excess humus.
Ma Manahawkin	Poor: wetness.	Probable	Probable	Poor: excess humus, area reclaim, wetness.
Mc Matunuck	Poor: wetness.	Probable	Improbable: too sandy.	Poor: excess humus, excess salt, wetness.
MfA, MfB, MfC Montauk	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
MfD Montauk	Fair: wetness, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
MkA, MkB Montauk	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
Pa---------- Pawcatuck	Poor: wetness.	Probable----------	Improbable: excess fines.	Poor: excess humus, excess salt, wetness.
Pg*, Pk*. Pits				
PlB, PlC---------- Plymouth	Good----------	Probable----------	Probable----------	Poor: small stones, area reclaim.
PrD*: Plymouth----------	Poor: slope.	Probable----------	Probable----------	Poor: small stones, area reclaim.
Riverhead----------	Poor: slope.	Probable----------	Probable----------	Poor: small stones, slope.
RdA, RdB, RdC---------- Riverhead	Good----------	Probable----------	Probable----------	Poor: small stones.
RdD---------- Riverhead	Fair: slope.	Probable----------	Probable----------	Poor: small stones, slope.
Sc, SdA, SdB---------- Scio	Fair: wetness.	Probable----------	Probable----------	Fair: area reclaim.
Su---------- Sudbury	Fair: wetness.	Probable----------	Probable----------	Poor: small stones, too sandy, area reclaim.
Ua. Udifluvents				
UdA, UdE, Ue. Udipsamments				
Uf. Udorthents				
Ug*. Urban land				
Uh*: Urban land.				
Hempstead----------	Good----------	Probable----------	Probable----------	Poor: area reclaim, small stones.
Um*: Urban land.				
Mineola----------	Fair: wetness.	Probable----------	Probable----------	Poor: small stones, area reclaim.

See footnote at end of table.

TABLE 12.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
UnB*, UnC*: Urban land.				
Montauk	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
UpA*, UpB*, UpC*: Urban land.				
Plymouth	Good	Probable	Probable	Poor: small stones, area reclaim.
UpD*: Urban land.				
Plymouth	Fair: slope.	Probable	Probable	Poor: small stones, area reclaim.
UrA*, UrB*, UrC*: Urban land.				
Riverhead	Good	Probable	Probable	Poor: small stones.
Us*: Urban land.				
Sudbury	Fair: wetness.	Probable	Probable	Poor: small stones, too sandy, area reclaim.
Uu*, Uw*: Urban land. Udipsamments.				
Wa Wallington	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
Wd Walpole	Poor: wetness.	Probable	Probable	Poor: wetness, small stones.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--WATER MANAGEMENT

(Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated. The information in this table indicates the dominant soil condition but does not eliminate the need for onsite investigation)

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Grassed waterways
At---------- Atsion	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty, fast intake.	Wetness, droughty, rooting depth.
Bc*. Beaches						
Bd---------- Berryland	Severe: seepage.	Severe: seepage, piping, wetness.	Severe: cutbanks cave.	Wetness, cutbanks cave.	Wetness, droughty.	Not needed.
Du*: Duneland.						
Udipsamments.						
EnA, EnB. Enfield						
Fr---------- Freetown	Severe: seepage.	Severe: excess humus, wetness.	Slight---------	Frost action---	Wetness--------	Wetness.
He---------- Hempstead	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Erodes easily	Erodes easily.
Ip---------- Ipswich	Severe: seepage.	Severe: excess humus, ponding, excess salt.	Severe: salty water.	Flooding, excess salt, ponding.	Ponding, flooding, excess salt.	Excess salt, wetness.
Ma---------- Manahawkin	Severe: seepage.	Severe: excess humus, ponding.	Severe: slow refill, cutbanks cave.	Ponding, flooding, frost action.	Ponding, flooding.	Wetness.
Mc---------- Matunuck	Severe: seepage.	Severe: seepage, ponding, excess salt.	Severe: salty water, cutbanks cave.	Ponding, flooding, cutbanks cave.	Ponding, flooding, excess salt.	Wetness, excess salt.
MfA---------- Montauk	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Percs slowly---	Percs slowly, rooting depth.	Rooting depth, percs slowly.
MfB---------- Montauk	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Percs slowly, slope.	Percs slowly, rooting depth, slope.	Rooting depth, percs slowly.
MfC, MfD---------- Montauk	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Percs slowly, slope.	Percs slowly, rooting depth, slope.	Slope, rooting depth, percs slowly.

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Grassed waterways
MkA---------- Montauk	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Percs slowly---	Percs slowly, rooting depth.	Rooting depth, percs slowly.
MkB---------- Montauk	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Percs slowly, slope.	Percs slowly, rooting depth, slope.	Rooting depth, percs slowly.
Pa---------- Pawcatuck	Severe: seepage.	Severe: excess humus, ponding, excess salt.	Severe: salty water, cutbanks cave.	Flooding, excess sulfur, excess salt.	Ponding, flooding, excess salt.	Wetness, excess salt.
Pg*, Pk*. Pits						
PlB---------- Plymouth	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Droughty.
PlC---------- Plymouth	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Slope, droughty.
PrD*: Plymouth---------	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Slope, droughty.
Riverhead--------	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope----------	Slope.
RdA---------- Riverhead	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Favorable------	Favorable.
RdB---------- Riverhead	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope----------	Favorable.
RdC, RdD---------- Riverhead	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope----------	Slope.
Sc, SdA---------- Scio	Moderate: seepage.	Severe: piping, wetness.	Severe: cutbanks cave.	Cutbanks cave, frost action.	Erodes easily, wetness.	Erodes easily.
SdB---------- Scio	Moderate: seepage, slope.	Severe: piping, wetness.	Severe: cutbanks cave.	Slope, cutbanks cave, frost action.	Slope, erodes easily, wetness.	Erodes easily.
Su---------- Sudbury	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness--------	Favorable.
Ua. Udifluvents						
UdA, UdE, Ue. Udipsamments						

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Grassed waterways
Uf. Udorthents						
Ug*. Urban land						
Uh*: Urban land.						
Hempstead	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Erodes easily	Erodes easily.
Um*: Urban land.						
Mineola	Severe: seepage.	Severe: seepage.	Severe: cutbanks cave.	Cutbanks cave	Wetness, droughty.	Droughty.
UnB*: Urban land.						
Montauk	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Percs slowly, slope.	Percs slowly, rooting depth, slope.	Rooting depth, percs slowly.
UnC*: Urban land.						
Montauk	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Percs slowly, slope.	Percs slowly, rooting depth, slope.	Slope, rooting depth, percs slowly.
UpA*: Urban land.						
Plymouth	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake.	Droughty.
UpB*: Urban land.						
Plymouth	Severe: seepage.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Droughty.
UpC*, UpD*: Urban land.						
Plymouth	Severe: seepage, slope.	Severe: seepage, piping.	Severe: no water.	Deep to water	Droughty, fast intake, slope.	Slope, droughty.
UrA*: Urban land.						
Riverhead	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Favorable	Favorable.
UrB*: Urban land.						

See footnote at end of table.

TABLE 13.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Aquifer-fed excavated ponds	Drainage	Irrigation	Grassed waterways
UrB*: Riverhead	Severe: seepage.	Severe: seepage.	Severe: no water.	Deep to water	Slope	Favorable.
UrC*: Urban land.						
Riverhead	Severe: seepage, slope.	Severe: seepage.	Severe: no water.	Deep to water	Slope	Slope.
Us*: Urban land.						
Sudbury	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Cutbanks cave	Wetness	Favorable.
Uu*, Uw*: Urban land.						
Udipsamments.						
Wa Wallington	Slight	Severe: piping, wetness.	Severe: no water.	Percs slowly, frost action.	Wetness, percs slowly, rooting depth.	Wetness, erodes easily, rooting depth.
Wd Walpole	Severe: seepage.	Severe: seepage, wetness.	Severe: cutbanks cave.	Frost action, cutbanks cave.	Wetness	Wetness.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--ENGINEERING INDEX PROPERTIES

(The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated)

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
At---------- Atsion	0-7	Loamy sand-------	SP-SM, SM	A-3, A-1-B, A-2-4	0	95-100	90-100	45-80	5-35	---	NP
	7-36	Loamy sand, sand.	SM, SP-SM	A-2-4, A-3, A-1-B, A-4	0	95-100	85-100	40-75	5-40	---	NP
	36-60	Sand, loamy sand, gravelly sand.	SM, SM-SC, SP-SM	A-2-4, A-3, A-1-B	0	85-100	70-100	40-75	5-30	<20	NP-7
Bc*. Beaches											
Bd---------- Berryland	0-8	Mucky loamy sand	SP, SP-SM	A-3	0	95-100	90-100	55-90	2-10	---	NP
	8-27	Gravelly sand, loamy sand.	SP, SP-SM	A-2, A-3	0	60-100	50-100	40-90	2-10	---	NP
	27-60	Gravelly sand, loamy sand, very gravelly sand.	SP, SM-SC, GP, GM-GC	A-1, A-2, A-3	0	45-100	35-100	20-90	2-35	<25	NP-8
Du*: Duneland.											
Udipsamments.											
EnA, EnB---------- Enfield	0-10	Silt loam--------	ML	A-4	0	95-100	95-100	85-100	70-95	<35	NP-7
	10-32	Silt loam, very fine sandy loam.	ML	A-4	0	95-100	95-100	85-100	65-95	<35	NP-5
	32-60	Very gravelly sand, gravelly sand.	SP,GP, SP-SM, GP-GM	A-1	10-40	30-70	20-60	15-45	0-10	---	NP
Fr---------- Freetown	0-7	Muck----------	PT	A-8	---	---	---	---	---	---	---
	7-60	Muck----------	PT	A-8	---	---	---	---	---	---	---
He---------- Hempstead	0-11	Silt loam--------	ML	A-4	0	95-100	95-100	90-100	75-95	<35	NP-7
	11-29	Silt loam, very fine sandy loam.	ML	A-4	0	95-100	95-100	90-100	75-95	<35	NP-5
	29-33	Very gravelly loamy sand, gravelly sandy loam.	GW-GM, SW-SM, SM	A-1	0-10	30-75	20-60	10-40	5-25	---	NP
	33-60	Stratified sand to gravel.	SP, GP, SP-SM, GP-GM	A-1	0-20	30-75	20-60	10-40	0-10	---	NP
Ip---------- Ipswich	0-21	Mucky peat-------	PT	A-8	0	---	---	---	---	---	NP
	21-36	Mucky peat-------	PT	A-8	0	---	---	---	---	---	NP
	36-60	Muck, mucky peat	PT	A-8	0	---	---	---	---	---	NP
Ma---------- Manahawkin	0-36	Muck----------	PT	A-8	---	---	---	---	---	---	---
	36-60	Sand, gravelly sand.	SW, SP, SP-SM, GW	A-1	0	40-100	35-100	20-50	4-10	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Mc	0-8	Mucky peat	PT	A-8	0	---	---	---	---	---	NP
Matunuck	8-60	Sand, loamy sand	SM, SP, SW	A-2, A-3	0	95-100	85-100	50-60	0-25	---	NP
MfA, MfB, MfC, MfD	0-7	Fine sandy loam	SM, SM-SC	A-2, A-4	0-5	80-100	75-100	45-95	20-85	<20	NP-4
Montauk	7-34	Fine sandy loam, gravelly sandy loam, silt loam.	SM, ML, SM-SC, CL-ML	A-2, A-4, A-1	0-15	60-100	55-95	35-90	15-80	<20	NP-4
	34-60	Sandy loam, loamy sand, gravelly sandy loam.	SM, SP-SM, GM, GP-GM	A-2, A-1, A-4	0-15	60-100	55-95	20-80	10-50	<15	NP-2
MkA, MkB	0-9	Silt loam	ML, SM, SM-SC, CL-ML	A-4, A-2, A-1	0-5	80-100	75-95	45-95	20-85	<20	NP-4
Montauk	9-31	Fine sandy loam, gravelly sandy loam, silt loam.	SM, ML, SM-SC, CL-ML	A-2, A-4, A-1	0-15	60-100	55-95	35-90	15-80	<20	NP-4
	31-60	Sandy loam, loamy sand, gravelly sandy loam.	SM, SP-SM, GM, GP-GM	A-2, A-1, A-4	0-15	60-100	55-95	20-80	10-50	<15	NP-2
Pa	0-33	Mucky peat	PT	A-8	0	---	---	---	---	---	NP
Pawcatuck	33-60	Very fine sandy loam, silt loam, sandy loam.	ML, SM	A-2, A-4	0	95-100	95-100	75-100	20-95	<20	NP-5
	50-60	Loamy sand, loamy fine sand, gravelly sand.	SM, SP, SW	A-1, A-2, A-3	0	80-100	60-100	35-75	0-30	---	NP
Pg*, Pk*. Pits											
PlB, PlC	0-5	Loamy sand	SM, SP	A-1, A-2, A-3	0-5	80-100	75-95	35-65	2-30	---	NP
Plymouth	5-26	Loamy sand, loamy fine sand, gravelly coarse sand.	SM, SP	A-1, A-2, A-3	0-5	65-100	60-95	35-65	2-30	---	NP
	26-60	Gravelly coarse sand, very gravelly sand, sand.	SW, GW, SP, GP	A-1	0-5	40-80	35-75	20-50	2-10	---	NP
PrD*:											
Plymouth	0-5	Loamy sand	SM, SP	A-1, A-2, A-3	0-5	80-100	75-95	35-65	2-30	---	NP
	5-26	Loamy sand, loamy fine sand, gravelly coarse sand.	SM, SP	A-1, A-2, A-3	0-5	65-100	60-95	35-65	2-30	---	NP
	26-60	Gravelly coarse sand, very gravelly sand, sand.	SW, GW, SP, GP	A-1	0-5	40-80	35-75	20-50	2-10	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
PrD*:											
Riverhead-------	0-3	Sandy loam-------	SM, ML	A-2, A-4	0-5	95-100	90-100	55-95	30-75	14-18	1-3
	3-24	Sandy loam, fine sandy loam, gravelly sandy loam.	SM, GM	A-2, A-4, A-1	0-5	65-100	60-95	40-80	20-45	14-18	1-3
	24-35	Loamy sand, gravelly loamy sand, fine sandy loam.	SM, SP-SM, GM, GP-GM	A-1, A-2, A-4	0-5	60-90	55-85	30-70	10-45	---	NP
	35-60	Stratified sand and gravel.	SP, SW, SP-SM	A-1	0-5	60-95	55-90	25-50	0-10	---	NP
RdA----------	0-3	Sandy loam-------	SM, ML	A-2, A-4	0-5	95-100	90-100	55-95	30-75	14-18	1-3
Riverhead	3-24	Sandy loam, fine sandy loam, gravelly sandy loam.	SM, GM	A-2, A-4, A-1	0-5	65-100	60-95	40-80	20-45	14-18	1-3
	24-35	Loamy sand, gravelly loamy sand, fine sandy loam.	SM, SP-SM, GM, GP-GM	A-1, A-2, A-4	0-5	60-90	55-85	30-70	10-45	---	NP
	35-60	Stratified sand and gravel.	SP, SW, SP-SM	A-1	0-5	60-95	55-90	25-50	0-10	---	NP
RdB, RdC, RdD----	0-3	Sandy loam-------	SM, ML	A-2, A-4	0-5	95-100	90-100	55-95	30-75	14-18	1-3
Riverhead	3-24	Sandy loam, fine sandy loam, gravelly sandy loam.	SM, GM	A-2, A-4, A-1	0-5	65-100	60-95	40-80	20-45	14-18	1-3
	24-35	Loamy sand, gravelly loamy sand, fine sandy loam.	SM, SP-SM, GM, GP-GM	A-1, A-2, A-4	0-5	60-90	55-85	30-70	10-45	---	NP
	35-60	Stratified sand and gravel.	SP, SW, SP-SM	A-1	0-5	60-95	55-90	25-50	0-10	---	NP
Sc----------	0-12	Silt loam--------	ML	A-4	0	100	95-100	90-100	70-90	<20	NP-4
Scio	12-60	Silt loam, very fine sandy loam.	ML	A-4	0	100	95-100	90-100	70-90	<20	NP-4
SdA, SdB---------	0-12	Silt loam--------	ML	A-4	0	100	95-100	90-100	70-90	<20	NP-4
Scio	12-43	Silt loam, very fine sandy loam.	ML	A-4	0	100	95-100	90-100	70-90	<20	NP-4
	43-60	Very gravelly loamy sand to silt loam.	ML, SM, SP, GP-GM	A-4, A-2, A-1, A-3	0	35-95	30-90	15-85	2-80	<10	NP-4
Su----------	0-5	Sandy loam-------	SM, ML	A-2, A-4, A-1	0-5	85-100	70-100	40-90	20-55	---	NP
Sudbury	5-18	Sandy loam, fine sandy loam, gravelly sandy loam.	SM	A-2, A-4, A-1	0-5	85-100	60-100	40-80	20-50	---	NP
	18-28	Gravelly coarse sand, loamy sand, sandy loam.	SM, SP-SM	A-1, A-2, A-3	0-5	70-100	60-100	30-70	5-35	---	NP
	28-60	Stratified sand and gravel.	SP, SP-SM, GP, GP-GM	A-1	10-40	35-70	25-65	15-45	0-10	---	NP

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Ua. Udifluvents											
UdA, UdE, Ue. Udipsamments											
Uf. Udorthents											
Ug*. Urban land											
Uh*: Urban land.											
Hempstead-------	0-11	Silt loam--------	ML	A-4	0	95-100	95-100	90-100	75-95	<35	NP-7
	11-29	Silt loam, very fine sandy loam.	ML	A-4	0	95-100	95-100	90-100	75-95	<35	NP-5
	29-33	Very gravelly loamy sand, gravelly sandy loam.	GW-GM, SW-SM, SM	A-1	0-10	30-75	20-60	10-40	5-25	---	NP
	33-60	Stratified sand to gravel.	SP, GP, SP-SM, GP-GM	A-1	0-20	30-75	20-60	10-40	0-10	---	NP
Um*: Urban land.											
Mineola---------	0-11	Sandy loam-------	ML-SM, SM, ML	A-2, A-4, A-1	0-5	70-100	65-100	45-75	20-60	<35	2-10
	11-18	Very gravelly loamy sand, gravelly loamy sand, loamy fine sand.	GW-GM, SW-SM, SM, GM	A-1	0-10	30-100	20-100	10-40	5-25	---	NP
	18-60	Stratified sand to gravel.	SP, GP, SP-SM, GP-GM	A-1	0-20	30-100	20-100	10-40	0-10	---	NP
UnB*, UnC*: Urban land.											
Montauk---------	0-7	Fine sandy loam	SM, SM-SC	A-2, A-4	0-5	80-100	75-100	45-95	20-85	<20	NP-4
	7-34	Fine sandy loam, gravelly sandy loam, silt loam.	SM, ML, SM-SC, CL-ML	A-2, A-4, A-1	0-15	60-100	55-95	35-90	15-80	<20	NP-4
	34-60	Sandy loam, loamy sand, gravelly sandy loam.	SM, SP-SM, GM, GP-GM	A-2, A-1, A-4	0-15	60-100	55-95	20-80	10-50	<15	NP-2
UpA*, UpB*, UpC*, UpD*: Urban land.											

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
UpA*, UpB*, UpC*, UpD*:											
Plymouth-------	0-5	Loamy sand-------	SM, SP	A-1, A-2, A-3	0-5	80-100	75-95	35-65	2-30	---	NP
	5-26	Loamy sand, loamy fine sand, gravelly coarse sand.	SM, SP	A-1, A-2, A-3	0-5	65-100	60-95	35-65	2-30	---	NP
	26-60	Gravelly coarse sand, very gravelly sand, sand.	SW, GW, SP, GP	A-1	0-5	40-80	35-75	20-50	2-10	---	NP
UrA*, UrB*, UrC*: Urban land.											
Riverhead-------	0-3	Sandy loam-------	SM, ML	A-2, A-4	0-5	95-100	90-100	55-95	30-75	14-18	1-3
	3-24	Sandy loam, fine sandy loam, gravelly sandy loam.	SM, GM	A-2, A-4, A-1	0-5	65-100	60-95	40-80	20-45	14-18	1-3
	24-35	Loamy sand, gravelly loamy sand, fine sandy loam.	SM, SP-SM, GM, GP-GM	A-1, A-2, A-4	0-5	60-90	55-85	30-70	10-45	---	NP
	35-60	Stratified sand and gravel.	SP, SW, SP-SM	A-1	0-5	60-95	55-90	25-50	0-10	---	NP
Us*: Urban land.											
Sudbury---------	0-5	Sandy loam-------	SM, ML	A-2, A-4, A-1	0-5	85-100	70-100	40-90	20-55	---	NP
	5-18	Sandy loam, fine sandy loam, gravelly sandy loam.	SM	A-2, A-4, A-1	0-5	85-100	60-100	40-80	20-50	---	NP
	18-28	Gravelly coarse sand, loamy sand, sandy loam.	SM, SP-SM	A-1, A-2, A-3	0-5	70-100	60-100	30-70	5-35	---	NP
	28-60	Stratified sand and gravel.	SP, SP-SM, GP, GP-GM	A-1	10-40	35-70	25-65	15-45	0-10	---	NP
Uu*, Uw*: Urban land.											
Udipsamments.											
Wa---------------	0-13	Silt loam--------	ML, CL-ML	A-4	0	100	95-100	90-100	70-90	15-20	3-6
Wallington	13-24	Very fine sandy loam, silt loam.	ML, CL-ML	A-4	0	100	95-100	90-100	70-90	15-20	3-6
	24-42	Very fine sandy loam, silt loam.	ML, CL-ML	A-4	0	100	95-100	90-100	70-90	15-20	3-6
	42-60	Very fine sandy loam, loamy very fine sand, silt loam.	ML, SM	A-4	0	95-100	90-100	65-95	40-90	<20	NP-3

See footnote at end of table.

TABLE 14.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
Wd----------	0-8	Sandy loam-------	SM	A-2, A-4	0-5	90-100	85-100	70-100	30-50	<25	NP-3
Walpole	8-18	Fine sandy loam, sandy loam, gravelly sandy loam.	SM	A-2, A-4	0-5	85-100	60-100	40-95	25-50	---	NP
	18-60	Gravelly loamy sand, very gravelly sand, sand.	SP, SM, GP, GP-GM	A-1, A-2, A-3	0-20	45-100	40-100	25-90	0-25	---	NP

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS

(The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated)

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Erosion factors		Organic matter
							K	T	
	In	Pct	G/cc	In/hr	In/in	pH			Pct
At----------	0-7	1-6	1.00-1.40	6.0-20	0.04-0.08	4.5-5.5	0.17	3	2-4
Atsion	7-36	2-7	1.40-1.60	2.0-20	0.04-0.15	4.5-5.5	0.20		
	36-60	2-10	1.60-1.80	6.0-20	0.04-0.14	4.5-5.5	0.20		
Bc*.									
Beaches									
Bd----------	0-8	1-5	1.30-1.45	6.0-20	0.06-0.08	3.6-5.0	0.17	2	4-8
Berryland	8-27	2-7	1.40-1.55	2.0-6.0	0.08-0.12	3.6-5.0	0.20		
	27-60	3-10	1.50-1.60	2.0-20	0.04-0.14	4.5-5.5	0.17		
Du*:									
Duneland.									
Udipsamments.									
EnA, EnB.									
Enfield									
Fr----------	0-7	---	0.10-0.30	0.6-6.0	0.35-0.45	3.6-4.4	----	---	>50
Freetown	7-60	---	0.15-0.30	0.6-6.0	0.35-0.45	3.6-4.4	----		
He----------	0-11	5-15	1.00-1.15	0.6-2.0	0.25-0.35	4.5-6.0	0.49	3	5-10
Hempstead	11-29	5-10	1.20-1.50	0.6-2.0	0.15-0.25	4.5-6.0	0.64		
	29-33	0-5	1.45-1.65	6.0-20	0.02-0.09	4.5-6.0	0.20		
	33-60	0-3	1.45-1.65	>20.0	0.01-0.02	4.5-5.5	0.10		
Ip----------	0-21	---	0.10-0.30	0.6-20	0.18-0.35	5.6-7.8	----	---	20-90
Ipswich	21-36	---	0.10-0.30	0.6-20	0.18-0.35	5.6-7.8	----		
	36-60	---	0.10-0.30	0.6-20	0.18-0.35	5.6-7.8	----		
Ma----------	0-36	---	0.30-0.65	0.6-6.0	0.30-0.35	4.5-5.5	----	---	20-95
Manahawkin	36-60	0-10	1.10-1.70	2.0-20	0.04-0.08	4.5-5.5	0.17		
Mc----------	0-8	---	0.30-0.80	6.0-20	0.18-0.35	5.1-7.8	----	---	20-75
Matunuck	8-60	0-2	1.45-1.70	>20	0.02-0.13	5.1-7.8	0.17		
MfA, MfB, MfC,									
MfD----------	0-7	6-18	1.00-1.25	0.6-6.0	0.16-0.18	3.6-6.0	0.24	3	2-6
Montauk	7-34	6-18	1.30-1.60	0.6-6.0	0.10-0.16	3.6-6.0	0.24		
	34-60	1-18	1.70-1.90	0.06-0.6	0.02-0.08	3.6-6.0	0.24		
MkA, MkB----------	0-9	6-18	1.00-1.25	0.6-2.0	0.16-0.20	3.6-6.0	0.32	3	2-6
Montauk	9-31	6-18	1.30-1.60	0.6-2.0	0.12-0.16	3.6-6.0	0.24		
	31-60	1-18	1.70-1.90	0.06-0.6	0.02-0.08	3.6-6.0	0.24		
Pa----------	0-33	---	0.10-0.70	0.6-20	0.18-0.36	5.1-7.8	----	---	20-90
Pawcatuck	33-60	1-10	1.40-1.65	0.6-20	0.16-0.24	5.1-7.8	0.49		
	50-60	0-2	1.45-1.70	>20	0.02-0.13	5.1-7.8	0.10		
Pg*, Pk*.									
Pits									
PlB, PlC----------	0-5	1-5	1.10-1.40	6.0-20	0.04-0.08	4.5-5.5	0.17	2	2-4
Plymouth	5-26	1-5	1.25-1.55	6.0-20	0.03-0.07	4.5-5.5	0.17		
	26-60	1-5	1.45-1.65	>20	0.02-0.03	4.5-5.5	0.17		

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Erosion factors		Organic matter
							K	T	
	In	Pct	G/cc	In/hr	In/in	pH			Pct
PrD*:									
Plymouth	0-5	1-5	1.10-1.40	6.0-20	0.04-0.08	4.5-5.5	0.17	2	2-4
	5-26	1-5	1.25-1.55	6.0-20	0.03-0.07	4.5-5.5	0.17		
	26-60	1-5	1.45-1.65	>20	0.02-0.03	4.5-5.5	0.17		
Riverhead	0-3	3-10	1.10-1.40	2.0-6.0	0.14-0.16	4.5-5.5	0.28	3	2-4
	3-24	1-8	1.25-1.55	2.0-6.0	0.09-0.13	4.5-5.5	0.28		
	24-35	1-8	1.25-1.55	2.0-6.0	0.04-0.13	4.5-5.5	0.17		
	35-60	1-8	1.45-1.65	>20	0.02-0.04	4.5-5.5	0.17		
RdA	0-3	3-10	1.10-1.40	2.0-6.0	0.14-0.16	4.5-5.5	0.28	3	2-4
Riverhead	3-24	1-8	1.25-1.55	2.0-6.0	0.09-0.13	4.5-5.5	0.28		
	24-35	1-8	1.25-1.55	2.0-6.0	0.04-0.13	4.5-5.5	0.17		
	35-60	1-8	1.45-1.65	>20	0.02-0.04	4.5-5.5	0.17		
RdB, RdC, RdD	0-3	3-10	1.10-1.40	2.0-6.0	0.14-0.16	4.5-5.5	0.28	3	2-4
Riverhead	3-24	1-8	1.25-1.55	2.0-6.0	0.09-0.13	4.5-5.5	0.28		
	24-35	1-8	1.25-1.55	2.0-6.0	0.04-0.13	4.5-5.5	0.17		
	35-60	1-8	1.45-1.65	>20	0.02-0.04	4.5-5.5	0.17		
Sc	0-12	2-15	1.20-1.50	0.6-2.0	0.18-0.21	4.5-6.0	0.49	3	2-8
Scio	12-60	2-15	1.20-1.50	0.6-2.0	0.17-0.20	4.5-6.0	0.64		
SdA, SdB	0-12	2-15	1.20-1.50	0.6-2.0	0.18-0.21	4.5-6.0	0.49	3	2-8
Scio	12-43	2-15	1.20-1.50	0.6-2.0	0.17-0.20	4.5-6.0	0.64		
	43-60	0-10	1.60-1.90	0.06-0.6	0.02-0.19	5.1-6.0	0.17		
Su	0-5	2-6	1.10-1.40	2.0-6.0	0.10-0.25	3.6-6.0	0.24	3	2-6
Sudbury	5-18	2-7	1.15-1.45	2.0-6.0	0.07-0.18	3.6-6.0	0.24		
	18-28	0-4	1.25-1.45	2.0-20	0.01-0.15	3.6-6.0	0.17		
	28-60	0-3	1.30-1.45	6.0-20	0.01-0.06	3.6-6.0	0.10		
Ua. Udifluvents									
UdA, UdE, Ue. Udipsamments									
Uf. Udorthents									
Ug*. Urban land									
Uh*: Urban land.									
Hempstead	0-11	5-15	1.00-1.15	0.6-2.0	0.25-0.35	4.5-6.0	0.49	3	5-10
	11-29	5-10	1.20-1.50	0.6-2.0	0.15-0.25	4.5-6.0	0.64		
	29-33	0-5	1.45-1.65	6.0-20.0	0.02-0.09	4.5-6.0	0.20		
	33-60	0-3	1.45-1.65	>20	0.01-0.02	4.5-5.5	0.10		
Um*: Urban land.									
Mineola	0-11	0-10	1.00-1.25	2.0-6.0	0.12-0.25	4.5-6.0	0.20	3	5-10
	11-18	0-5	1.25-1.50	2.0-6.0	0.02-0.09	4.5-6.0	0.17		
	18-60	0-3	1.45-1.65	>20	0.01-0.02	4.5-6.0	0.10		
UnB*, UnC*: Urban land.									

See footnote at end of table.

TABLE 15.--PHYSICAL AND CHEMICAL PROPERTIES OF THE SOILS--Continued

Soil name and map symbol	Depth	Clay	Moist bulk density	Permeability	Available water capacity	Soil reaction	Erosion factors		Organic matter
							K	T	
	In	Pct	G/cc	In/hr	In/in	pH			Pct
UnB*, UnC*:									
Montauk---------	0-7	6-18	1.00-1.25	0.6-6.0	0.16-0.20	3.6-6.0	0.24	3	2-6
	7-34	6-18	1.30-1.60	0.6-6.0	0.10-0.16	3.6-6.0	0.24		
	34-60	1-18	1.70-1.90	0.06-0.6	0.02-0.08	3.6-6.0	0.24		
UpA*, UpB*, UpC*, UpD*:									
Urban land.									
Plymouth-------	0-5	1-5	1.10-1.40	6.0-20	0.04-0.08	4.5-5.5	0.17	2	2-4
	5-26	1-5	1.25-1.55	6.0-20	0.03-0.07	4.5-5.5	0.17		
	26-60	1-5	1.45-1.65	>20	0.02-0.03	4.5-5.5	0.17		
UrA*, UrB*, UrC*:									
Urban land.									
Riverhead-------	0-3	3-10	1.10-1.40	2.0-6.0	0.14-0.16	4.5-5.5	0.28	3	2-4
	3-24	1-8	1.25-1.55	2.0-6.0	0.09-0.13	4.5-5.5	0.28		
	24-35	1-8	1.25-1.55	2.0-6.0	0.04-0.13	4.5-5.5	0.17		
	35-60	1-8	1.45-1.65	>20	0.02-0.04	4.5-5.5	0.17		
Us*:									
Urban land.									
Sudbury---------	0-5	2-6	1.10-1.40	2.0-6.0	0.10-0.25	3.6-6.0	0.24	3	2-6
	5-18	2-7	1.15-1.45	2.0-6.0	0.07-0.18	3.6-6.0	0.24		
	18-28	0-4	1.25-1.45	2.0-20	0.01-0.15	3.6-6.0	0.17		
	28-60	0-3	1.30-1.45	6.0-20	0.01-0.06	3.6-6.0	0.10		
Uu*, Uw*:									
Urban land.									
Udipsamments.									
Wa---------------	0-13	5-18	1.20-1.50	0.6-2.0	0.19-0.21	4.5-5.5	0.49	3	2-6
Wallington	13-24	5-18	1.20-1.50	0.6-2.0	0.18-0.20	4.5-5.5	0.64		
	24-42	5-18	1.50-1.80	0.06-0.2	0.10-0.14	5.1-5.5	0.64		
	42-60	2-18	1.45-1.65	0.06-0.2	0.10-0.14	5.6-6.5	0.64		
Wd---------------	0-8	2-6	1.00-1.25	2.0-6.0	0.10-0.23	4.5-6.0	0.20	3	2-8
Walpole	8-18	2-6	1.30-1.55	2.0-6.0	0.07-0.18	4.5-6.0	0.24		
	18-60	0-2	1.40-1.65	>6.0	0.01-0.13	4.5-6.0	0.10		

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--SOIL AND WATER FEATURES

("Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol < means less than; > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated)

Soil name and map symbol	Hydrologic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
At---------- Atsion	C/D	None--------	---	---	0-1.0	Apparent	Nov-Jun	Moderate	Low------	High.
Bc*. Beaches										
Bd---------- Berryland	B/D	Rare--------	---	---	0-0.5	Apparent	Oct-Jun	Low------	High-----	High.
Du*: Duneland.										
Udipsamments.										
EnA, EnB. Enfield										
Fr---------- Freetown	D	None--------	---	---	0-1.0	Apparent	Jan-Dec	High-----	High-----	High.
He---------- Hempstead	B	None--------	---	---	>6.0	---	---	Moderate	Low------	Moderate.
Ip---------- Ipswich	D	Frequent----	Very brief	Jan-Dec	+1-0	Apparent	Jan-Dec	---	High-----	High.
Ma---------- Manahawkin	D	Frequent----	Long------	Jan-Mar	+1-0	Apparent	Oct-Jul	High-----	High-----	High.
Mc---------- Matunuck	D	Frequent----	Very brief	Jan-Dec	+1-0	Apparent	Jan-Dec	---	High-----	High.
MfA, MfB, MfC, MfD, MkA, MkB---- Montauk	C	None--------	---	---	2.0-2.5	Perched	Feb-May	Moderate	Low------	High.
Pa---------- Pawcatuck	D	Frequent----	Very brief	Jan-Dec	+1-0	Apparent	Jan-Dec	---	High-----	High.
Pg*, Pk*. Pits										
PlB, PlC---------- Plymouth	A	None--------	---	---	>6.0	---	---	Low------	Low------	High.
PrD*: Plymouth---------	A	None--------	---	---	>6.0	---	---	Low------	Low------	High.
Riverhead--------	B	None--------	---	---	>6.0	---	---	Moderate	Low------	High.
RdA, RdB, RdC, RdD---------- Riverhead	B	None--------	---	---	>6.0	---	---	Moderate	Low------	High.
Sc, SdA, SdB------ Scio	B	None--------	---	---	1.5-2.0	Apparent	Mar-May	High-----	Moderate	Moderate.

See footnote at end of table.

TABLE 16.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydrologic group	Flooding			High water table			Potential frost action	Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months		Uncoated steel	Concrete
					Ft					
Su---------- Sudbury	B	None--------	---	---	1.5-3.0	Apparent	Dec-Apr	Moderate	Low------	High.
Ua. Udifluvents										
UdA, UdE, Ue. Udipsamments										
Uf. Udorthents										
Ug*. Urban land										
Uh*: Urban land.										
Hempstead--------	B	None--------	---	---	>6.0	---	---	Moderate	Low------	Moderate.
Um*: Urban land.										
Mineola----------	A	None--------	---	---	2.0-4.0	Apparent	Mar-May	Moderate	Low------	Moderate.
UnB*, UnC*: Urban land.										
Montauk----------	C	None--------	---	---	2.0-2.5	Perched	Feb-May	Moderate	Low------	High.
UpA*, UpB*, UpC*, UpD*: Urban land.										
Plymouth--------	A	None--------	---	---	>6.0	---	---	Low------	Low------	High.
UrA*, UrB*, UrC*: Urban land.										
Riverhead--------	B	None--------	---	---	>6.0	---	---	Moderate	Low------	High.
Us*: Urban land.										
Sudbury----------	B	None--------	---	---	1.5-3.0	Apparent	Dec-Apr	Moderate	Low------	High.
Uu*, Uw*: Urban land.										
Udipsamments.										
Wa---------- Wallington	C	None--------	---	---	0.5-1.5	Perched	Jan-Apr	High-----	High-----	Moderate.
Wd---------- Walpole	C	None--------	---	---	0-1.0	Apparent	Nov-Apr	High-----	Low------	High.

* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Atsion	Sandy, siliceous, mesic Aeric Haplaquods
Berryland	Sandy, siliceous, mesic Typic Haplaquods
Freetown	Dysic, mesic Typic Medisaprists
Hempstead	Coarse-silty over sandy or sandy-skeletal, mixed, mesic Typic Haplumbrepts
Ipswich	Euic, mesic Typic Sulfihemists
Manahawkin	Sandy or sandy-skeletal, siliceous, dysic, mesic Terric Medisaprists
Matunuck	Sandy, mixed, mesic Typic Sulfaquents
Mineola	Sandy-skeletal, mixed, mesic Entic Haplumbrepts
Montauk	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Pawcatuck	Sandy or sandy-skeletal, mixed, euic, mesic Terric Sulfihemists
Plymouth	Siliceous, mesic Typic Udipsamments
Riverhead	Coarse-loamy, mixed, mesic Typic Dystrochrepts
Scio	Coarse-silty, mixed, mesic Aquic Dystrochrepts
Sudbury	Sandy, mixed, mesic Aquic Dystrochrepts
Udifluvents	Udifluvents
Udipsamments	Udipsamments
Udorthents	Udorthents
Wallington	Coarse-silty, mixed, mesic Aeric Fragiaquepts
Walpole	Sandy, mixed, mesic Aeric Haplaquepts

TABLE 18-RELATIONSHIP OF PARENT MATERIAL, POSITION, AND DRAINAGE OF SOILS

Parent material and soil characteristics*	Excessively drained	Somewhat excessively drained	Well drained	Moderately well drained	Somewhat poorly drained	Poorly drained	Very poorly drained
			SOILS ON TILL PLAINS				
Very deep, moderately coarse textured soils in glacial till.			Montauk				
Very deep, medium textured soils overlying glacial till.				Scio, till substratum			
			SOILS ON OUTWASH PLAINS				
Very deep, medium textured soils with a light-colored surface layer that overlie glacial outwash, sand and gravel.			Enfield				
Very deep, medium textured soils with a dark colored surface layer that overlie glacial outwash sand and gravel.			Hempstead				
Very deep, moderately coarse textured soils that overlie glacial outwash sand and gravel.			Riverhead	Sudbury	Walpole	Walpole	
Very deep, coarse textured soils with a dark-colored surface layer that overlie glacial outwash, sand and gravel.				Mineola			
Very deep, coarse textured soils that overlie glacial outwash, sand and gravel.	Plymouth					Atsion	Berryland
			SOILS IN LACUSTRINE BASINS				
Very deep, medium textured soils in lacustrine deposits.				Scio	Wallington		
			SOILS ON FLOOD PLAINS				
Very deep, medium textured or moderately coarse textured soils in alluvial sediments.			Udifluvents	Udifluvents			

TABLE 18-RELATIONSHIP OF PARENT MATERIAL, POSITION, AND DRAINAGE OF SOILS--Continued

Parent material and soil characteristics*	Excessively drained	Somewhat excessively drained	Well drained	Moderately well drained	Somewhat poorly drained	Poorly drained	Very poorly drained
	SOILS IN SWAMPS, BOGS, AND TIDAL MARSHES						
Muck more than 51 inches thick in fresh water organic deposits.							Freetown
Muck 16 to 51 inches thick in fresh water organic deposits over sandy mineral material.							Manahawkin
Muck and peat more than 51 inches thick in saltwater organic deposits.							Ipswich
Peat 16 to 51 inches thick in saltwater organic deposits over sand and loamy mineral material.							Pawcatuck
Peat less than 16 inches thick in saltwater organic deposits over sandy mineral material.							Matunuck
	SOILS MIXED BY MAN ON OUTWASH PLAINS AND TILL PLAINS						
Very deep, coarse textured soils in mixed sandy material that overlies ogranic deposits.	Udipsamments	Udipsamments	Udipsamments	Udipsamments, wet substratum			
Very deep, coarse textured soils in mixed sandy till material that overlies manmade refuse.	Udorthents						

*Texture is the dominant texture of the subsoil.

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